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ABSTRACT

This annotated bibliography, Part 1., is a compilation of books, articles, reviews, and other materials concerning graduate education. Citations are categorized according to history and development, students, structure and functions, instruction and research, manpower, costs and financing, and recommendations. An author index is included. Related documents, Part II and III, are ED o72 734 and ED 067 051. (MJM)

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ON GRADUATE EDUCATION

OFFICE OF THE CHAIRMAN - UNIVERSITY OF ILLINOIS, CHAMPAIGN, ILLINOIS 61820

AN ANNOTATED INTEROFFICE
BIBLIOGRAPHY ON GRADUATE EDUCATION

Parts I - III

January, 1973

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National Board on Graduate Education
Office of the Chairman
345 Armory, University of Illinois
Champaign, Illinois 61820

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Part I

National Board on Graduate Education
Office of the Chairman
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May 3, 1972

P R E F A C E

This annotated bibliography is a compilation of those books, articles, reviews, and other materials -- published and unpublished -- which were either sent to this office or brought to our attention between February 1 and April 30, 1972.

The categories used here are identical with those employed by Wayne C. Hall in his Annotated Bibliography on Graduate Education: 1950-1971. The initial pages for the categories are as follows:

1. History and Development	Page - 1
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Edward L. Allen
Staff Associate
Champaign, Illinois
May, 1972

HISTORY AND DEVELOPMENT

-- Daniels, George

Science in American Society: A Social History.

New York: Alfred Knopf, 1971.

Daniels examines the role of science in the history of the United States, reviewing the development of its present status, its rhetoric, and its ideology and institutional framework. He sketches the developmental stages of science, dividing them into four periods: the colonial, the republican, the professional, and the imperial. The book offers an intellectual and historical framework out of which the present can be better understood by identifying the powerful sources of continuity in the past.

-- Gagnon, John H.

"A Review of Science in American Society: A Social History, by George Daniels" Change, Vol. 4 (February, 1972), 56-58.

In his book, Daniels examines the troubles facing universities regarding the funding of programs in the sciences, mathematics, and engineering. He also notes that a long and bloody struggle is sure to emerge regarding the redistribution of hard money within university budgets.

In his review of the book, Gagnon refers to it as an enlightening work which traces the history of the development of the present status of science, its rhetoric, ideology and institutional framework, and notes that Daniels pictures scientists as either saints or monsters. While Daniels sketches four stages in the development of science (the colonial, the republican, the professional, and the imperial), Gagnon feels that the illumination of the period before the First World War is immensely useful. Referring to the book as a detailed scholarly treatment of the role of science in the history of the United States, Gagnon suggests that the book is a useful manual for nonscientists in the university community who share committees with their colleagues in the sciences, and provides a better understanding of those endless speeches about the nobility of science and the defenses of distortions of university resources. It is, in Gagnon's view, a valuable survey, well-written and intelligently presented. He feels that its major weakness lies in its minimal coverage of the scientific "imperium" of the last quarter century and its insufficient consideration of the social and modern biological sciences.

S T U D E N T S

-- Creager, John A.

The American Graduate Student: A Normative Description

Washington, D.C.: American Council on Education, 1971

Mr. Creager examines the findings from a survey conducted in the spring of 1969 by the Council and the Carnegie Commission on Higher Education providing graduate student's attitudes toward higher education and toward society in general. Treatment includes: The American Graduate Student-a Normative Description; The Graduate Student Population and Its Sampling; Weighting Procedures; and the National Normative Estimates.

-- Harvey, James

The Student in Graduate School

Washington, D.C.: American Association for Higher Education, 1972

Mr. Harvey assesses the major criticisms of doctoral education centering on the position of the graduate student.

The report is the first in a new series of the ERIC Clearinghouse on Higher Education to be published by the American Association for Higher Education (AAHE). The author begins with the premise that much of the published literature during the sixties treating graduate education dealt with manpower needs, or anecdotal criticisms of doctoral education. Much of the criticism centered on the position of the graduate students. Since several major studies on graduate students have been published recently, the ERIC Clearinghouse on Higher Education (the author is a Research Associate with the Clearinghouse) felt it appropriate to assess the major criticisms in light of the research findings.

CAREERS

-- Nelson, Jeffrey B.

"Two-year College Teachers in the Making"

American Education. Vol. 8 (March 1972), 21-24.

Nelson examines the career orientation of young graduate students. He suggests that many of them do not want the discipline problems high school teachers must face, yet simultaneously reject the "Ph.D. syndrome" connected with university teaching. As a result, they are choosing teaching careers in community and junior colleges. He describes an experimental Master's degree program which seeks to determine whether it is desirable or even possible to train persons specifically for teaching on the two-year college level. The program is now in its first year at the State University of New York College at Fredonia.

STRUCTURE AND FUNCTIONS

-- Hall, Wayne C.

An Annotated Bibliography on Graduate Education, 1950-71

Washington, D.C.: National Research Council, 1971.

This work reviews the literature on graduate education which appeared between 1950 and 1971. It focuses upon the traditional areas of graduate education. References concerned mainly with other professional fields, degrees, and programs, such as medicine, law, theology, etc., in general are excluded.

ADMISSIONS

-- Howard, Bill

"Blacks and Professional Schools"

Change, Vol. 4 (February 1972), 13-16.

The author draws attention to the fact that black students are encountering difficulty gaining admission not only to white graduate schools, but also to the handful of historically black graduate and professional schools. Much of the attrition is attributed to the same drying up of federal and private support that has affected graduate education generally.

He bases much of his analysis on figures from the Office of Education and the Bureau of Labor Statistics. He also refers to the recent Carnegie Commission study of black higher education Between Two Worlds, by Frank Bowles and Frank A. DeCosta. He also cites studies conducted on black students in medicine and law.

It is also noted that difficulties encountered by blacks in white graduate schools have reached the point where a group of 125 black administrators and faculty have formed the ad hoc National Alliance for Graduate Education and Professional Training for Black People.

While the commitment on the part of graduate schools to assist minority students is seriously hindered by lack of funds, the author feels that at those schools where a strong commitment has been made, funds have been found.

INSTRUCTION AND RESEARCH

-- Orlans, Harold

The Nonprofit Research Institute

New York: McGraw-Hill Book Company, 1972

In this work, the ninth of a series of profiles sponsored by the Carnegie Commission on Higher Education, the author looks at the nonprofit research institute in light of its origin, its operation, its problems, and its prospects. He examines the agencies involved that have developed within the twentieth century and most dramatically since World War II. The impact of the 1969 Tax Reform Act on their operations is examined closely along with the effects of competition, the declining role of universities in institute management, the probabilities of the institutes' success in solving social problems, and the accounting that institutes must provide if the federal government is to evolve an informed policy toward them. He suggests that the social upheaval that began in the mid-sixties has had profound implication for these organizations. As a result of that upheaval, their funding, organization, operation, and the very basis for their justification have been brought under scrutiny. He argues that the public is concerned that technological development has been emphasized at the expense of social and economic ills. In response to this concern, many institutes are now diversifying their activities, undertaking work in the social sciences as well as the physical and biological sciences.

In part four, Orlans examines some trends and problems. Of special interest are the chapters in part four entitled, "Intersectoral Competition," and "University and Institute Research: Is the Balance Tilting?" In part five, the chapters "An Assessment," and "Recommendations" are of special interest.

-- Persell, Caroline

The Quality of Research on Education: An Empirical Study of Researchers and Their Work

New York: Columbia University, Bureau of Applied Social Research, 1972.

This is a report on a national panel of 40 eminent researchers which rated the quality of all papers read at the 1968 American Educational Research Association meeting and of all education-related research articles published in 113 journals in 1967-68. Also, the authors of the papers were surveyed and data regarding their education, careers, research settings, etc. were analyzed in relation to the quality of their research.

-- Stever, H. Guyford

"Proposed Increase in Civilian Research and Development Aimed at Improving Productivity and the Quality of Life - Basic Research Recognized"

Remarks made before the Committee on Science and Astronautics, House of Representatives, February 9, 1972. (Mimeographed.)

Testifying on National Science Foundation authorizations for fiscal year 1973, Dr. Stever pointed out that NSF occupies a strategic position in science and that it is significant that the continuing importance of basic research is recognized in the expanded efforts of NSF together with other science programs. He lists the major objectives of NSF for FY 1973:

- strengthen basic research to increase our fundamental knowledge and to provide the scientific underpinning needed for continued application of science and technology to the needs of the Nation;
- test incentives to encourage increased non-Federal investment in research and development;
- undertake selected efforts to focus research on national goals in major areas of domestic concerns; and,
- improve our understanding of science policies and the impact of R&D in our economy and society.

He also discusses the question of fundamental research support, research applied to national needs, and special program initiatives.

-- U. S. News and World Report

"Campus Research: A Giant in Trouble"

U. S. News and World Report, December 20, 1971, pp. 33-37.

This article examines the reasons for the recent decrease in research spending at universities and colleges. It notes that funding of projects connected with national security has dropped and funding for civilian programs has increased.

DEGREES

-- Abbott, Michael C.

"A Graduate Student Looks at the 'New' Doctor of Arts Degree"

AAUP Bulletin, Vol. 57 (Autumn, 1971). 364-367.

The author examines the weaknesses and strengths of the D.A. degree. He notes that it may well prove to be an unsaleable commodity and decries attempts to strengthen the distinction between teaching and research.

-- American Association of State Colleges and Universities

The Doctor of Arts Degree: A Proposal for Guidelines

Washington, D.C.: American Association of State Colleges and Universities, 1970.

This booklet was prepared by the AASCU Committee on Graduate Studies. The report argues in favor of the Doctor of Arts degree. The authors note that the present interest in a Doctor of Arts degree or its equivalent springs from a number of needs. There is, for example, a definite need to provide another road to academic recognition and success, a road different from the Ph.D., particularly for those whose careers are in teaching. This other road is provided through the Doctor of Arts degree. There is also the need to recognize that a rapidly changing society requires a specialized type of teacher -- one who can synthesize knowledge, use the specialist's research for the advancement of man, and provide an important bridge for our public institutions in the multiple relationships they are developing with a variety of groups both on and off campus.

The topics treated include the following: 1) Requirements for Admission to the Program; 2) Selective Retention; 3) Resident Requirements; 4) Research Experience; 5) Program of Study; 6) Length of Program; 7) Examinations; 8) Library Resources; and 9) Faculty.

-- Council of Graduate Schools in the United States

Supplemental Statement on the Doctor of Arts Degree

Washington, D.C.: The Council of Graduate Schools in the United States, 1972.

This is the second of two booklets published by CGS dealing with the Doctor of Arts degree. It is a revision of the first booklet which was published in March of 1970. While the Doctor of Arts degree is referred to as a fait accompli in the revised version, it is also characterized as an evolving degree and the new statement reflects study and assessment of current trends and developments. Topics discussed include the following: 1) Rationale for the Degree; 2) Institutional Qualifications; 3) Characteristics of Teaching Scholars; 4) Control and Organization; 5) General Requirements; 6) Academic Content; 7) Professional Components and the Internships; and 8) Research Components.

In summarizing, the following position is taken. The Doctor of Arts should be granted only by those institutions which have the physical and intellectual resources to offer advanced graduate study leading to doctoral degrees. The issue is not whether the degree is comparable to traditional research degrees or will replace existent professional degrees which provide certain specialized expertise in academic life. The admission and retention of graduate students should be as rigorous as for the research doctorate. The Council views the Doctor of Arts as a degree to prepare professional, academically well-qualified teaching scholars for college classrooms. Experimental and evolutionary though the degree may be at this point in time, the single general standard which must be applied in all respects is that of high quality. This can and will be assured only if the universities provide such quality as they develop the Doctor of Arts degree.

-- Mayhew, Lewis B.

"Jottings"

Change, Vol. 4 (February 1972), 54-55.

The author examines those forces he feels will force graduate faculties to change and undertake serious reform. He also examines questions regarding degree structures and programs.

-- National Academy of Sciences

The Invisible University: Postdoctoral Education in the United States

Washington, D.C.: National Academy of Sciences, 1969.

This work, a report of a study conducted under the auspices of the National Research Council, is the result of a concern within the NRC and elsewhere about the scope of postdoctoral education in the U. S. The purpose of this study was to provide the basic facts about postdoctoral study as it exists in the United States today so that those entrusted with academic, administrative, and legislative responsibilities could better cope with perceived problems.

Topics include: an historical view; the demography of postdoctoral education; implication for the postdoctoral; implications for academic institutions; implications for nonacademic institutions; the foreign postdoctoral; the finances of postdoctoral education; and a summary of conclusions.

-- Proctor, Alvin H.

The Doctor of Arts Degree

Washington, D.C.: Council on Graduate Schools in the United States, 1970.

This statement concerning the Doctor of Arts degree was prepared for Council on Graduate Schools in the U. S. by the Committee on the Preparation of College Teachers. It is in response to requests from governmental agencies, graduate deans, and other educators. The statement is submitted in the belief that 2 premises are of prime importance: that the new degree should be offered in well-established universities which already offer the Ph.D. in order that the Doctor of Arts may utilize the academic validity and reputation of graduate study in those universities thus ensuring high standards and its acceptance as a new degree in graduate education. Moreover, the Council of Graduate Schools through the inherent nature of this organization should describe essential characteristics and provide guidelines for future development at other institutions.

The statement includes the rationale for such a degree, as well as its general and special characteristics.

-- Stever, H. Guyford

"Doctor of Arts Degree"

Science, Vol. 170 (November 6 1970), 587.

This is an editorial describing the rationale for the D.A. degree. Stever notes slow acceptance and calls for broader support. He discusses specifically the Doctor of Arts degree program established several years ago at Carnegie-Mellon University.

PROGRAMS

-- Breneman, David W.

The Ph.D. Degree at Berkeley: Interviews, Placement, and Recommendations

Berkeley: University of California, Office of the Vice President - Planning and Analysis, 1971.

This is one among a series of reports sponsored by the Ford Foundation (Research Program in University Administration at the University of California, Berkeley). It is the third of three papers analyzing departmental variations in time to degree and attrition in 28 Ph.D. programs at the University of California, Berkeley.

-- Elton, Charles F., and Rodgers, Samuel A.

"Physics Department Ratings: Another Evaluation"

Science, Vol. 174 (November 5, 1971), 565-568.

The authors look at evaluation procedures in graduate education and conclude that objective variables provided a good approximation of the numerical ratings of the graduate programs in the Cartter study. But they feel additional correlates of departmental ratings are warranted.

-- Koenker, Robert H.

"Status of the Doctor of Arts Degree Programs for Preparing Junior College and College Teachers"

Unpublished paper. Graduate School, Ball State University, Muncie, Indiana, November 22, 1971. (Mimeographed.)

Report of a nation-wide survey of the status of the D.A. degree for preparing Junior College and college teachers. It provides a listing of 76 institutions which offer, or were planning to offer, or were considering the possibility of offering the D.A. degree. The graduate deans of the 288 member institutions of the Council of Graduate Schools in the United States were sent the questionnaires used in the study.

In summary, it would appear that the D.A. degree is becoming more widely accepted and recognized. In March, 1970, there were 76 institutions which offered, were planning to offer, or were considering the possibility of offering the D.A. degree. The number of such institutions had increased to 87 by November, 1971, in spite of the increased oversupply of Ph.D.'s, the financial restrictions placed on many institutions, and the fact that a number of state coordinating boards have ruled against the establishment of new doctoral programs.

-- Lemonick, Aaron

"The Plight of the Graduate School: One Dean's Views"

Princeton University. Unpublished paper, 1972.

A dean of the graduate college at Princeton University examines the impact of fiscal restraints on students and graduate programs in general. He points to the grim facts of decreasing external support which, he fears, will cut so deeply into the number of graduate students, that there will result a lowering of the standard of excellence in graduate students and graduate education. Referring to the projected Ph.D. oversupply, he suggests that unless students stop coming, or enrollments are cut back, the projections will come true. While Princeton Ph.D.'s are still getting jobs, the "remedial" steps taken by the Federal government are hitting hardest at quality institutions.

He illustrates his arguments by pointing to the fact that at Princeton the number of graduate students supported by outside funds of all sorts, government, foundations, and corporate, will have gone from about 1,060 in 1969-70 to about 550 in 1973-74. During these same years, the number supported by University funds will have risen from 420 to 690. The situation may go to the point where some entire graduate programs must disappear from the curriculum in order not to weaken all of them.

In brief, graduate schools are feeling a sharp, shock-wave-like decrease in graduate support funds from outside sources. The largest part of the decrease is caused by the reduction or termination of federally funded programs. This massive curtailment in support threatens to do real injury to graduate schools. In many cases graduate schools have already significantly reduced the size of entering classes. Further reductions will mean not only lost opportunities for students who merit the best doctoral education we have to offer, but far more serious for the long run, these reductions will hurt quality graduate education in the nation, because these same institutions will be forced to discontinue entire Ph.D. programs which stand among the best.

-- Quad-Cities Graduate Study Center

Annual Report, 1971

Rock Island, Illinois: Quad-Cities Graduate Study Center, 1971.

The report details the features of the Center, which is a consortium of nine colleges and universities in Illinois and Iowa. All of the institutions support graduate programs; five at the master's degree level. During the 1971-72 academic year, almost 3,000 registrants were involved in full- and part-time study. The Center has no minimum as residence requirement, and the transfer of credit within the consortium is maximized.

Those institutions included in the consortium are the following: In Illinois - Augustana College, Northern Illinois University, Southern Illinois University, University of Illinois, Western Illinois University; in Iowa - Iowa State University, Marycrest College, University of Iowa, University of Northern Iowa.

-- Roose, Kenneth D., and Andersen, Charles J.

A Rating of Graduate Programs

Washington, D.C.: American Council on Education, 1970. .

This report presents the principal findings of the 1969 Survey of Graduate Education, a study similar in concept and conduct to the one directed by Allan M. Cartter in 1964 and described in his An Assessment of Quality in Graduate Education, published by the American Council on Education in 1966. A fundamental purpose of the report is to furnish prospective graduate students with information on faculties and programs.

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M A N P O W E R

-- Balderston, F. E. and Radner, Roy

Academic Demand for New Ph.D.'s, 1970-90: Its Sensitivity to Alternate Policies

Berkeley: University of California, Office of the Vice President-Planning, 1971.

This report is one of a series of reports of the Ford Foundation sponsored Research Program in University Administration at the University of California, Berkeley. The paper investigates the plausibility of various projections of academic demand for doctorates over the next two decades. It examines the contributions to this demand by different sectors of higher education and offers some policy implications relevant for various decision-makers involved in higher education.

It does not deal with the question of supply nor investigate prospects for employment of new doctorates in industrial and governmental research and professional work, as distinct from faculty appointment in colleges and universities. However, it treats in some detail the plausibility of recent projections of academic demand for new doctorates, examines the possible contributions to this demand by each major sector of American higher education, and seeks to illumine some positive policy choices in the financing and staffing standards of higher education.

-- Board of Higher Education, State of Illinois

"Committee V: Engineering"

Springfield, Illinois: State Board of Higher Education, October, 1970.
Unpublished report. (Mimeographed.)

The charge to "Committee V: Engineering" was to answer the following questions: 1) What are the trends in the supply and demand for professional personnel in Engineering?; 2) If the supply is insufficient, how should the production of professional personnel be increased?; and 3) How can graduate and professional education in Engineering be improved? The three major topics covered in the report are the trends in the supply and demand for professional personnel in engineering, an approach to increased production of professional personnel, and methods of improving graduate and professional education in engineering.

The Committee's general findings and recommendations included, among other statements, the following:

General Findings: The technological level of industry within the State of Illinois must rise continually to meet both foreign and domestic competition. Solution of the problems of pollution, health care, and many other problems of urban and rural society will require the continuing attention of the brightest and most highly educated of engineers in ever increasing numbers. Therefore, the well-being of the country as a whole and the citizens of the State depend critically upon educating engineering students and engineers in practice to

the highest level of their capabilities and aspirations in order to maximize the contribution of this small but vital fraction of our population.

Recommendations: Planning should be authorized for the substantial addition of buildings, equipment, and staff needed to permit this growth from the present level of about 650 master's and 250 doctor's degrees in engineering per year to about 2100 master's and 600 doctor's by 1980.

-- Bock, Robert M.

"Ph.D.'s Coming and Going"

Science, Vol. 173 (July 2, 1971) 6-7.

In a letter to the Editor, the author supports Allan Cartter's call for more objective and thorough skilled manpower forecasting. He sees signs of a new public dogma of "gluttism" emerging which derives from the present forecasts that by 1980 there will be 48,000 - 80,000 new Ph.D.'s annually.

On the basis of the April 1971 survey of programs at Wisconsin, they are convinced that these projections are much too high and fail to take full account of the remarkable adjustments that are occurring.

At Wisconsin Ph.D. output will continue to climb and reach a plateau in 1971-72. After 1972-73, a decline will begin and continue until at least 1975-76. There will most likely be a similar decline in other top institutions.

Rate of growth of the past decade, based upon availability of public resources, cannot be sustained even by newer or "emerging" institutions. State or Federal funds for such expansion will not be available.

Bock therefore predicts that the level of Ph.D. output in 1980 is likely to exceed 1971 level only to the extent that the emerging institutions can afford the great financial sacrifice of growth with their own funds.

To survive, those institutions must achieve a quality acceptable to the students who personally shoulder much of the cost, depending upon new funds that might be generated to fill specific manpower shortages, or depending upon the chance that there might be a reversal of the current strong reaction of state and federal policy to Cartter's projections. If the supply curve is different than that predicted by Cartter, then the current state and federal policies may lead to sweeping dismantling of public support programs for the training of scientific manpower. Then tragic damage may be done in many fields.

-- Brode, Wallace R.

"Manpower in Science and Engineering, Based on a Saturation Model"

Science, Vol. 173 (July 16, 1971) 206-213.

The author examines the assumption that young people are turning away from science in greater numbers than ever before. They argue that one could with equal proof substantiate the argument that young people are turning toward science in greater numbers than ever before.

They examine: 1) Approaching Ceilings in Scientific and Technological Manpower; 2) Career Selection in Science and Engineering; 3) Changing Size of the College-Age Population; 4) A Holding Pattern for Today's Surplus; 5) Ratio of B.S.'s to Ph.D.'s as a Measure of an Area's Development; 6) the Prospect of a Shortage of Scientists and Engineers; 7) Suggested Cures for the Problems of the Surplus; 8) Census Projections; and 9) A Manpower Employment and Training Act.

Proper presentation of the short-term need for preserving the technical abilities of those people whose careers require long training periods and who will be in short supply in the near future should enable the Congress to obtain presidential approval for a ready reserve program as part of a revised manpower employment and training act in the current session of Congress.

-- Cartter, Allan

"Ph.D.'s Coming and Going"

Science, Vol. 173 (July 2, 1971), 6-7.

In a response to several letters to the Editor, Allan Cartter replies that Mazur and Einhorn are rightfully concerned with maintaining institutional vitality in the next two decades. Higher education could stagnate if some means is not found for a constant influx of bright young scholars. While expansion of the market has long provided that opportunity, the next 20 years could make the colleges look like the American railroad today.

Spengler is rightfully concerned with the individual's welfare and his potential contribution. Cartter shares those concerns and was simply arguing in his proposal that a faculty should have the option of replacing a colleague who has not retained his scholarly prowess after 25 years, and that all professors should have the option of seeking a new career or opportunity for service without major financial risk.

He shares Bock's concluding sentiments and has pleaded for an understanding and sustaining federal policy. He does not feel as optimistic as Bock about the possibility of stabilizing doctoral output in many fields. He feels Wisconsin's is somewhat unique in that Wisconsin has done a better job than most states in preventing the proliferation of graduate programs.

-- Cartter, Allan M.

"Scientific Manpower for 1970-1985"

Science, Vol. 172 (April 9, 1971), 132-140.

This article is based on an address given at the AAAS meeting in Chicago, December 27, 1970. It restates the thesis that the oversupply of Ph.D.'s will seriously affect higher education and national science policy. He argues that today's problems should not be attributed to just a temporary cutback in federal funds for education, research, and development. We have created a graduate education and research establishment in American universities that is about 30 to 50% larger than what we shall effectively use in the 1970's and early 1980's, and the growth process continues in many sectors.

Cartter points to studies done by OE and NSF in the late sixties which should have been warning signals of the impending oversupply. He makes a plea that some group coordinate efforts at estimating projecting needs and resources so that they may be made on mutually consistent assumptions.

Cartter believes it is urgently necessary for the federal government to identify a category of "national universities," perhaps 75 to 100 in number, and guarantee certain minimum support levels for graduate education, research, and student aid.

In an important sense, there is not a significant oversupply of persons trained at the doctoral level today. If the economy had proceeded at a near full employment level since 1968, the subject of this paper would not begin to attract attention for several years. If his analysis of the academic labor market is correct, however, the problem would have begun to emerge about 1969, but would not have become fully evident until the mid-1970's. The present recession, and most particularly the sharp federal cutbacks in education and R & D support, have given us several years' lead time in anticipating the more severe, real disequilibrium that looms in the years 1978 to 1990.

-- Drucker, Daniel C.

"Is the Future Bright or Bleak?"

Midwest Engineer, Vol. 24 (December, 1971), 4.

This article is based on a talk originally given before the Western Society of Engineers on November 10, 1971. In his examination of the current role of the engineer, the author points to four present and emerging points of agreement about engineers which are "disastrous nonsense." These points of agreement are: 1) We should discourage as many engineering students and engineers from going on to graduate study, doctoral study in particular, because there will be little demand for them; 2) We should establish professional schools of engineering which the student would enter in his junior year and in which engineering practice rather than research would be emphasized; 3) All engineers should be well enough in the useful social and behavioral sciences that upon graduation, they can solve the pressing social and political problems of society; and 4) We should abandon the traditional American goal of unlimited educational opportunity for all who can qualify, because we have come sufficiently close to achieving that goal.

Drucker argues against all four of these positions and also argues that the higher the level of education for any given group, the lower the level of unemployment for that group. Finally, he also argues against narrow specialization within the field of engineering.

-- Folger, John K., Astin, Helen S., and Bayer, Alan E.

Human Resources and Higher Education

New York: Russell Sage Foundation, 1970.

Beginning with the premise that how the nation develops and utilizes its human resources is determined by millions of individual decisions, each made for quite personal reasons and free choice, the authors sought to examine the fundamental characteristics of the system. The study is the result of their work for the Commission on Human Resources and Advanced Education.

The study includes chapters on the following topics: 1) Summary of Manpower Problems and Issues Facing the Nation, 2) The Market for College Graduates, 3) The Supply and Demand for Graduates in the Arts and Sciences, 4) Manpower Supply and Demand in Selected Professions; 5) The Flow of Students Through the Educational System, 6) Career Plans of High School and College Students, 7) the Mobility of High-Level Manpower, 8) Determinants of Professional Achievement and Rewards, 9) The Educational and Vocational Development of Women, 10) Talent Development Among Low Socioeconomic Groups, 11) The Effect of International Interchange of High-Level Manpower on the United States, 12) Manpower Planning and Manpower Market Operations, and 13) Research Needed on Talented Manpower.

Each chapter includes a summary and conclusions.

-- Freeman, Richard B.

"The Science Manpower Market in the 1970's"

Washington, D.C.: The National Science Board, 1972. Draft of a larger and unpublished study. (Mimeographed.)

Those topics treated by Mr. Freeman include the following: 1) The extent of the problem in the science manpower market; 2) Factors affecting the science manpower market. Proposition 1 - The science manpower market is governed by an endogenous mechanism that causes periodic shifts in supply-demand conditions and in resultant "shortages" and "surpluses." Proposition 2 - The R & D and manpower policies of the federal government have been the principal initiators of "shocks" causing cyclic fluctuation in the science market and have exacerbated adjustment problems. 3) Adjustments in the Manpower Market. Proposition 3 - Econometric analysis of the pattern of change in the starting rates of scientific and other college-trained specialists over the entire post-World War II period provides estimates of the responsiveness of salaries to market conditions in general.

Proposition 4 - The theory of derived demand tells us that change in salaries causes, cet. par., changes in demand for workers. Proposition 5 - The supply of workers, also, adjusts to changed economic conditions with young persons in particular showing great responsiveness to economic incentives. Proposition 6 - Experienced workers, also, adjust to changed conditions. 4) Forecasts of the Science Manpower Market; The Manpower Model.

-- Ginzberg, Eli

"The Outlook for Educated Manpower"

The Public Interest, No. 26 (Winter, 1972) 100-111.

The author points to the considerable evidences of trouble concerning the high unemployment rate among university trained people, but argues that the situation may not be as desperate as many think.

He examines the reasons for the high unemployment rate; the failure of monitoring agencies to anticipate the surpluses; the question of whether or not the current dire situation will be a short-lived or an extended one; the kinds of efforts employed to adjust to the current supply and demand problems; and recommends that the following steps be taken: 1) To take account in federal budget making of the manpower (particularly educated manpower) implications of the initiation, expansion, and continuation of large military and civilian programs; 2) To develop a long-run policy for the federal support of science, with regard to both level and rate of growth. Since the federal share is 60 per cent of a \$28 billion total, erratic fluctuations are certain to cause serious manpower distortions; 3) To evolve a long-run federal policy for the support of higher education (doctoral programs) that will help to keep solvent the 100 or so principal university centers and that will provide support for graduate students through a judicious mixture of grants and loans; 4) To consider alternative staffing arrangements in launching or expanding large federal programs -- e.g., health -- with the aim of economizing in the use of specialists with long periods of training. The Dean of Utah's Medical School has recently warned about the danger of a prospective oversupply of physicians, a warning that Ginzberg has sounded earlier.

-- Gordon, Margaret S.

"The Changing Labor Market for College Graduates"

Berkeley: Institute of Industrial Relations, 1971. (Mimeographed.)

This paper represents a partial and preliminary draft of the second chapter of a proposed volume of essays. The work, to be entitled Higher Education and the Labor Market, is being prepared in cooperation with the Institute of Industrial Relations at Berkeley.

-- Harvey, James

"Ph.D.'s and the Market Place"

Research Currents, (ERIC Clearinghouse on Higher Education, George Washington University, Washington, D.C.), February 1, 1972, p. 3.

This report is a review of the literature relating to the manpower debate. It includes a bibliography. It also suggests favorable and unfavorable outlooks for the following: Humanities; Social Sciences; Physical Sciences; Biological Sciences; Engineering; and Mathematics. The author concludes: It is hard to argue with the overwhelming evidence that if current trends continue, too many Ph.D.'s will be produced. However, few analysts would agree that substantial unemployment of Ph.D.'s will result. Instead, it is expected that education requirements for various positions will be upgraded and the Ph.D.'s will "bump" people with master's degrees from their positions. However, if there will not be massive unemployment, the amount of underemployment -- the use of Ph.D.'s in positions not allowing them to utilize their research skills -- will increase. It is essential that graduate students, particularly at developing institutions, be informed of this outlook.

Ph.D. manpower is expensive to produce. To utilize it fully, federal policies to expand research and development funds in areas of pressing social concerns should be encouraged. Transportation, housing, environmental and medical problems could be investigated by using humanists, social, bio- and physical scientists, and engineers. The manpower is too valuable and the social needs too pressing to allow doctoral recipients to waste their talents in unsuitable positions.

-- Jacobson, Robert L.

"Ph.D. Surplus Seen Overestimated"

The Chronicle of Higher Education, March 20 1972.

This is a review of a report by Laurence B. DeWitt and A. Dale Tussing, two economists at the federally supported educational policy division of the Syracuse University Research Corporation, contracted for by the U. S. Office of Education. The title of the report is not given.

The authors argue that the projected surpluses of Ph.D.'s and public school teachers in the 1970's probably will not be as severe as some studies have suggested. They advise federal officials to respond cautiously to the projections, lest they help turn surpluses into shortages. They acknowledge that there would be a fairly considerable overproduction of Ph.D.'s in this decade (400,000 produced compared with a demand for 190,000), but they had a number of reservations about those figures. They disputed prediction that government and industry would need only about 63,000 new Ph.D.'s in the '70's on the basis of past trends, and implied that the demand would be much greater and that virtually all Ph.D.'s not taken by academic institutions would be hired by government and industry.

The main problem, they said, was more likely to be underemployment -- the use of Ph.D.'s in positions for which they were "overqualified." Also, warning of a technology gap between the U. S. and other countries might well spur demands for more highly trained personnel in this country.

Their own estimate of the demand for Ph.D.'s in higher education was about 33,000 more than had been forecast a year earlier by Allan M. Cartter. They also challenged the "trend projection" that the teacher surplus for elementary and secondary schools would total 100,000 to 150,000 a year for the next decade. Either the demand will be greater than anticipated, they said, or the supply will be less, or both.

Regarding bachelor's degree recipients, they cited recent studies suggesting that the tight job market was due largely to a presumably short-term recession. But they called on the federal government to examine whether it was not spending a lot of money on "over-training the American work force."

-- Mazur, Allan and Einhorn, Martin

"Ph.D.'s Coming and Going"

Science, Vol. 173 (July 2, 1971) 6-7.

In a letter to the Editor, commenting on Allan Cartter's suggestion that retirement age be lowered to 64 to make more room for younger people, Mazur and Einhorn argue that one year is not enough and ask why not make the retirement age 60 or even 55. Adequate pensions could be fixed and arrangements made to use their skills outside academe. They argue that the benefits of a lowered retirement age would break the "tenured hold of unproductive older professors on scarce faculty positions."

-- National Science Foundation

Graduate Student Support and Manpower Resources in Graduate Science Education, Fall 1970

Washington, D.C.: U. S. Government Printing Office, 1971.

As a result of a policy decision by the present administration to replace direct grants with guaranteed loans, Federal support for graduate traineeships and fellowships have declined sharply in the last few years. Administration spokesmen have argued that increased numbers of research assistantships brought about through increased Federal support for project research at least in part offsets the drop in traineeships and fellowships.

The major conclusion to be drawn from the data presented in this report is that the arguments presented by the Administration spokesmen are not true. According to this report, the data show Federally sponsored research assistantships are declining also. The report also analyzes the changes in full-time graduate enrollment by broad discipline categories, such as engineering, mathematics, life sciences, and so on.

-- Perloff, Robert

"Enhancing Psychology by Assessing Its Manpower"

American Psychologist, Vol. 27 (May 1972), 355-361.

As the guest editor of a special issue of the American Psychologist, Perloff examines the manpower question relative to the field of psychology. He looks closely at manpower predictions and career choices, manpower demands and training implications the question of whether or not there is a Ph.D. glut, the need for manpower monitoring programs and finally, remediation strategies.

He notes that the effects of illusory prognostications not only play havoc with the plans of training institutions and other organizations, but they also may have disastrous implication for the morale and careers of young people. Commenting on the APA Task Force on Manpower Demands and Training Implications he points out that the chief recommendation of the Task Force was that a continuous personnel monitoring system or job clearinghouse be established, making possible at any given point in time answers to questions about manpower which are presently essentially speculative.

-- Semas, Philip W.

"Graduate-School Trends Alternately Worry and Cheer Deans"

Chronicle of Higher Education, December 13 1971.

This article reports on the discussions at the annual meeting of the Council of Graduate Schools in the United States. A great deal of attention is given to the questions of manpower and enrollments. The discussion includes treatment of cutbacks by States, the problem of selectivity, aid based on need, and the reluctance to experiment.

-- Shull, Harrison

"The Crisis of Confidence"

Paper prepared for the Association of Graduate Schools Annual Meeting, Minneapolis Minnesota, October 22, 1971. (Mimeographed.)

The author takes issue with those who feel we are producing too many Ph.D.'s and feels fundamental research in science (research oriented Ph.D.'s) will and should continue its major role. He admits, however, that there are symptoms of neglect and decay, loss of effectiveness and morale, and a crisis of confidence in present status of research-based graduate institutions. He also examines the following origins and causes of the decrease in funding: (1) institutional; (2) faculty; (3) students; (4) the general public view; and (5) government attitudes. He also argues that graduate schools should not promise better jobs upon completion of a degree. Further, he suggests that we need one excellent research-oriented and well-equipped graduate institution for every two million people which would mean about one hundred such institutions in the United States.

-- Spengler, Joseph T.

"Ph.D.'s Coming and Going"

Science, Vol. 173 (July 2, 1971), 6-7.

In a letter to the Editor, the argument is made that Cartter's otherwise very fine paper on manpower is marred by his proposal that professors be retired at age 64 or earlier. Using figures from a 1967 life table, Spengler questions whether a man retiring at 64 could have earned enough to support himself comfortably in his remaining years, given present or prospective post-retirement life expectancy. He also questions whether or not the half salary retirement scheme following 25 years of service regardless of age, as proposed by Cartter, would allow a person to be able to spend his or her remaining years in comfort. In addition, he wonders whether the economy or those in the lower age brackets would or could sustain such an arrangement.

Cartter's suggested arrangements, he feels, overlook the almost inevitable decline in the purchasing power of the pension dollar, and the denial to the retiree of a share in the increase in output associated with public investment. Spengler feels that only his ability to exercise his right to work is likely to guard the individual against inflation and other security-eroding forces.

-- Wolfe, Dael and Kidd, Charles V.

"The Future Market for Ph.D.'s"

Science, Vol. 173 (August 27 1971), 781-793.

The article examines: 1) the impact of the increased rate of Ph.D. production upon policy issues for universities and government; and 2) the differences in the rates of increase projected, in the assumptions on which the projections were based, in the methods employed, and in some of the implications for national policy and university plans.

The authors summarize and interpret a great deal of recent work on both supply projections and demand analysis. The discussion draws on documents and comments from an informal conference held on April 2, 1971, in Washington, D.C. Topics include: Doctoral Supply; Utilization; The Market in the 70's; Growth in Selected Areas; Market in the 80's; Reliability of the Projections; Better Information and Analysis Needed; Implications of a Buyer's Market; Increasing Demand; Restraining Expansion; Collective Action.

The authors conclude that even if agreement on "Solutions" is reached, the processes of adjustment will be difficult. More stringent admission standards, quotas, reduced financial support, incentives, or other means of controlling the number of doctorates will challenge established values, frustrate many students and many professors, exacerbate tensions among established and emerging institutions, aggravate the uneasy relationships between universities and government, complicate faculty-administration problems, and accentuate differences between older and younger faculty members. Some academicians will no doubt be inclined to the view that difficulties in the job market for young doctorates created by a laissez-faire approach are moderate compared with the difficulties that will be generated by efforts to adjust supply and demand.

They are also of the opinion that these problems must be faced, and that the long-range imbalance, inequities, and strains arising from ignoring the problem will far outweigh the stresses generated by efforts to cope with it.

EMPLOYMENT

-- Polinger, Madeleine

"Chemical Employment Should Bottom Out in 1972"

Chemistry and Engineering News, Vol. 50. (March 27, 1972). 10-11.

The author reports that while there will most likely not be an overall upturn in chemical jobs until 1973, a few companies have increased recruiting and hiring this year. In some instances, companies have increased campus recruiting and a survey conducted by the College Placement Council shows that drug and chemical employers are expected to hire 14% more graduates in 1972 than in 1971. The author also notes that employment prospects for chemists and chemical engineers within the Federal government remain about the same and that the tight supply of academic positions may have loosened up a bit.

ENROLLMENT

-- Burns, Richard L.

Report on the Council of Graduate Schools - Graduate Record Examinations Board 1971-72 Survey of Graduate Enrollment

Princeton, N.J.: Education Testing Service, 1972

This report analyzes the results of a survey of 298 graduate institutions which grant Master's or doctorate conducted jointly by GRE Board and CGS. The author concludes that while graduate enrollments overall seem to be stabilizing, there is no sharp downturn, despite substantial decline in available support.

- Federal Interagency Committee on Education

"Pre-doctoral Fellowships and Traineeships"

Washington, D.C.: U. S. Government Printing Office, 1972.

This two page listing presents figures for the 1970, 1971, and 1972 fiscal years on fellowship and traineeship grants provided by federal agencies. In general, the total dollars awarded by the several agencies has decreased by \$59,368 during the three-year period. Only two agencies, EPA and the Office of Education, show increased expenditures during the time span in question. The increases were in the amounts of \$1,434 for EPA and \$35,016 for the Office of Education.

PLANNING

-- Metz, David

"Ph.D.'s Should Be Planned"

New Scientist, Vol. 53 (February 17 1972), 386-388.

Looking at the role of the Ph.D. degree in British universities, Metz asks whether work done in pursuit of the degree should continue to be regarded as vocational training in which research methods are learned, or whether the degree should be thought of as a rather advanced general education for the "Higher fliers." He argues that even with no increase in the numbers of Ph.D. candidates, Britain's pool of Ph.D. scientists will eventually double. He feels prospects for employing them fully are gloomy and calls for the establishment of a new manpower planning body.

UTILIZATION

-- Harmon, Lindsey R.

Mobility of Ph.D.'s

Washington, D.C.: National Academy of Sciences, 1971.

This study was undertaken with the support of the National Institute of Health. The analysis begins with the premise that social, economic, disciplinary, and occupational mobility characterize all but the very poorest of our society. These kinds of mobility are highly important for the country as a whole and for the academic community in particular.

The report is concerned specifically with the mobility of holders of the doctorate. Immigration and internal migration are both considered, as are the factors that govern mobility among disciplines and occupations. The topics treated include the following: 1) International Migration; 2) History and Geography of U. S. Doctorate Output; 3) A Computerized Distance/Direction, Origin/Destination Metric; 4) State Indices of Prosperity and Education; and 5) Mobility After the Ph.D.

-- Morris, Jeffrey

Educational Training and Careers of Ph.D. Holders: An Exploratory Empirical Study

Berkeley: University of California - Ford Foundation Program for Research in University Administration, 1972.

This is one of a series of reports of the Ford Foundation Research Program in University Administration at University of California, Berkeley. This study analyzes the occupational mobility of individuals who hold the Ph.D. degree. Drawing upon data contained in the National Register of

Scientific and Technical Personnel compiled by the National Science Foundation, this paper presents the quantitative relationships between educational background, occupational mobility, and salaries. Based on these results, the author then presents and empirically tests an economic theory of Ph.D. occupational mobility.

The topics treated include: 1) Descriptive Data - Field of Ph.D. Degree and of Greatest Scientific Competence, Employment Speciality Field and Associated Salary, Job Mobility, Educational Background; and 2) Interpretations of the Descriptive Data and Tests of Some Hypotheses - The Relationship Between Occupational Mobility and Educational Background, A Theory of Ph.D. Occupational Mobility, The Relationship Between Salary and Educational Background, and Ph.D. Employer Mobility: Down a One-Way Street?

C O S T S A N D F I N A N C I N G

FEDERAL SUPPORT

-- Farber, M.A.

"Deans Say Lag in U. S. Aid Hinders Graduate Schools"

New York Times, December 5, 1971.

Referring to recent poll of professors by the American Council of Education, the author discusses the question of funding and decrease in enrollments and size of programs.

-- Young, M. Crawford, and Bock, Robert M.

"Hard Times for the Graduate Schools"

Change, Vol. 3 (Summer 1971) 20-22.

The authors examine the nation-wide erosion of support for graduate education as it affects one institution, the University of Wisconsin. Having listed several examples of how the shrinkage of federal funds has adversely affected programs, the authors raise two questions: How will graduate programs respond to the prospect of contraction? What will happen to the prospective students in biomedical fields, which will be particularly damaged by the possibility of dismantling the whole training grant system?

They conclude that remarkable adjustments have already occurred through cutbacks in enrollments. While the primary reason for the cutbacks seem to be based on the premise that there are too many Ph.D.'s, the problem of oversupply is actually selective and limited. For example, of 106 graduate departments and programs at Wisconsin, only 10 reported in March of 1971 a severe surplus situation; 29 indicated some surplus, while 50 found no surplus problem at all. Seventeen declared that there continued to be a deficit in their fields. While noting that other major institutions are moving in the same direction, the authors question whether institutions newly entered into the doctoral arena will seek to maintain or expand their present numbers.

They call attention to the view of those who feel that graduate education should be paid for entirely (through loans) by the student, not the society. While student loans may be very beneficial as a supplement, the authors argue, as a substitute, such loans are one additional threat to the survival of quality graduate education.

They suggest that we must fall back upon the hope that, when the decisive moment comes, the federal government will draw back from the extreme consequence of simply liquidating its assortment of graduate fellowship programs.

They conclude that present forecasts of catastrophic oversupply for the 1970's are at the very least, exaggerated. Changes already made could prove them wholly wrong. It would be a grave disservice to the public to dismantle the whole superstructure of graduate education on the basis of such uncertain evidence.

RECOMMENDATIONS

PURPOSES AND GOALS

-- Hackerman, Norman

"The Future of Graduate Education, If Any"

Science, Vol. 175 (February 4, 1972), 475.

The author examines our possibilities regarding the future of graduate education: 1) to continue seeking increased support for increased costs, as well as for expansion; 2) to (self-) limit proliferation on the individual campus by not acceding to the "attraction" argument; 3) to limit the number of universities offering a broad spectrum of courses; and 4) to decide that the enhancement no longer obtains and, therefore, to separate graduate from undergraduate education.

-- Heiss, Ann M.

Graduate Education in A Society in Transition: A Working Paper

Washington, D.C.: National Board on Graduate Education, March, 1972.
(Mimeographed.)

The author examines the current state of graduate education and presents a synthesis of recent research findings and a digest of the recommendations proposed by knowledgeable groups or persons who have given serious thought to the future of graduate education. Her focus, except in a few classic studies, is on the research literature published within the past five-year period and on the recommendations proposed during that same period. She suggests that those recommendations may serve as a basis on which rational discourse might begin. Included is a digest of recommendations made by various Assemblies, Boards, Commissions and Councils.

-- Kaysen, Carl

The Higher Learning, the Universities, and the Public

Princeton, N.J.: Princeton University Press, 1969.

Essentially an essay, the book examines the social functions of the American university in relation to its basis of financial support. The first two chapters contain the text of two Stafford Little lectures for 1967-68 delivered on February 6 and 8, 1968. The remainder of the book is devoted to indicating the way in which the author would answer the main question raised in the lectures.

The author's main thesis is that the basis on which much of the growing support from the public treasury has been asked and given in recent years does not correspond to what universities are actually doing. He reviews the development of the American graduate school and then examines the justifications that have been advanced for public support of science and learning.

The author argues in the third and final chapter that because it is becoming increasingly difficult and expensive for universities to perform functions of socialization and certification, the college, not the university, is the appropriate institution for performing those functions. He argues further, the present universities should, to the greatest possible extent, abandon the function of undergraduate socialization and certification to institutions primarily engaged in them, and reserve their own efforts for higher levels of training, the tasks of adapting scientific and technical knowledge and incorporation of it into the existing body of learning.

-- National Board on Graduate Education

Informal Notes on the Conference - Airlie Conference on the Support of Graduate Students, August 2-4, 1971 (Mimeographed.)

This mimeographed report describes the discussions which lead to the establishment of the National Board on Graduate Education and its role vis-a-vis the problems facing graduate education.

-- National Research Council

Report on the Conference on Predoctoral Education in the United States

Washington, D.C.: National Research Council, 1969.

This report is an attempt to summarize discussion at the conference held at Woods Hole, August 24-27, 1969. The conference considered the trends and actions affecting the stability of graduate education in the United States.

-- Stanford University

The Study of Education at Stanford: Part VII. Graduate Education

Stanford, California: Stanford University Press, 1969.

This is one of a series of special committee reports submitted to the Stanford University community for its consideration.

The report includes a discussion of selected issues in graduate education, recommendations, proposals for further consideration, and extensive appendix materials. Its first and major recommendation, that a commission be created to study in greater depth Stanford's problems in graduate education, emphasizes that the report is basically a working paper. Where the issues were

felt to be clear and the desired direction unambiguous, the authors make formal recommendations. For the most part, however, they present proposals needing additional scrutiny and discussion by all members of the Stanford community. With a view to starting this process, they include as appendices several resource papers that discuss a variety of aspects of graduate education and provide information, perspectives, and interpretations that extend -- and occasionally diverge from -- the material in the body of the report.

In the winter quarter of 1968, the Steering Committee sent to all Ph.D.-granting departments a tentative statement of its views in selected "problem" areas and requested departments to respond to the following twelve questions: 1) Should the route to the Ph.D. be broadened so as to permit award of the degrees to students whose primary interest is a teaching rather than a research career? Or would you prefer the establishment of a teaching degree such as the M.Phil.? On the other hand, do you find the present program and degree structure satisfactory? 2) Should dissertation specifications be amended so as to permit an alternative to the present research emphasis? 3) Should Ph.D. candidates be required to do some intensive supervised teaching as a regular part of their graduate program? 4) Should the graduate course structure and calendar be more flexible than at present? 5) Should faculty evaluation and judgment, more thorough comprehensive examinations, and the accomplishment of certain specified tasks or projects, replace courses and units as a principal measure of progress to the Ph.D.? 6) Do you favor a plan under which each graduate student is attached to a faculty tutor and the tutor assumes major responsibility for guiding and evaluating the student's progress? 7) Should the present nine-quarter residence requirement be dropped? 8) Should course letter grades be dropped as a measure of graduate student performance, to be replaced by evaluative statements that would become part of the student's record? 9) Should a more refined system of evaluating performance in comprehensive written and oral examinations be introduced to replace the present simple pass-fail structure? 10) Do you favor more active recruiting of graduate students? 11) Should Stanford undergraduates be eligible for admission to your graduate department for full Ph.D. study? For a shorter period of graduate study preliminary to Ph.D. work elsewhere? 12) What other major problems (excluding budgetary problems) confront your graduate programs, and what solutions do you recommend?

A summary of the responses to these questions is included.

PLANNING

-- Education Commission of the States

"Graduate Education in the Next Decade"

Compact, September 1971, p. 20.

This is a brief resumé of a clinic session from the Report of the Fifth Annual Meeting of the Education Commission of the States, "Educational Goals and Public Priorities. Too much growth and too little money was the central theme discussed at the session. Resource consultant, John Folger, pointed out

that the number of doctorates conferred has tripled in the last ten years. Panelists discussed the respective roles of the federal government, state governments, and educational institutions in assuming responsibility for review and evaluation of graduate educational needs, the fields in which programs should be offered, and responsibility for budgetary support of programs. The report calls for a joint effort in the formulation of a national policy on graduate education.

-- Magoun, H. W.

"Geographic and Institutional Aspects of Graduate Education and Research"

Graduate Education Today and Tomorrow. Leonard J. Kent and George P. Springer, editors. Albuquerque: University of New Mexico Press, 1972.

The author reviews some of the geographic and institutional factors that are likely to influence developments in graduate education and research in the coming decades. Recognizing that many of these factors are outside the control of the educational community, he feels that considerable information about them becomes available annually and a review of that information may point to directions and opportunities, as well as identify constraints, in educational planning for the future.

He examines, for example, such factors as the distribution of population and total personal income by states, dimensions and productivity of graduate education by states, the overall institutional standings in graduate education and research, and several others. Included are several useful tables and a bibliography.

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AN ANNOTATED INTEROFFICE BIBLIOGRAPHY
ON GRADUATE EDUCATION

Part II

National Board on Graduate Education
Office of the Chairman
345 Armory, University of Illinois
Champaign, Illinois 61820

August 15, 1972

P R E F A C E

This publication is one of a series of Interoffice Annotated Bibliographies developed for use in the Office of the Chairman and that of the Staff Director of the National Board on Graduate Education. The purpose of the bibliographies is to compile concisely annotate references of those materials (books, articles, reviews, and others), published and unpublished, which make a contribution to the expanding literature on graduate education and which continually arrive at the offices of National Board on Graduate Education. With each annotation, we have attempted to treat the author's intent and method, the major areas discussed, and the pertinent conclusions reached.

It is not the intent of this series to develop a definitive bibliography on graduate education. Much material recently appearing in the literature is not included here. The content represents only those documents sent to us or brought to our attention between May 1, 1972 and August 15, 1972, and is supplemental to Part I of this series (covering the period between February 1, 1972 and April 30, 1972), which appeared in May. We anticipate that Part III will cover roughly the period from August 16 to December 15, 1972.

The organization and categories used here follow those employed by Wayne C. Hall in his Annotated Bibliography on Graduate Education: 1950-1971, prepared under the aegis of the Office of Scientific Personnel of the National Research Council and published by the National Board on Graduate Education. Mr. Hall has been commissioned by the National Board to update the 1971 edition of the Bibliography, and it is expected that the updated draft will be available in the Fall of 1972.

While this Interoffice Bibliography on Graduate Education serves primarily as a working document for the offices and members of the National Board, it may serve others concerned with the study of present issues and the future of graduate education.

Edward L. Allen
Staff Associate
Champaign, Illinois
August, 1972

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-- Gregg, Wayne E.

"Several Factors Affecting Graduate Student Satisfaction"

Journal of Higher Education, Vol. 43 (June, 1972), 483-498.

The authors begin by noting that the significant contact the graduate student has with graduate education is through the department in which he is doing his graduate work. Most of this contact takes place within the context of two kinds of role relationships: Faculty-student relationships and student-student relationships. One of the major aims of the study described by the author was to investigate the extent to which the nature of these role relationships is related to the level of satisfaction experienced by the student.

Three hypotheses were examined in the study: (1) Both types of satisfaction (academic and nonacademic) will vary directly with collegiality of faculty-student relationships; (2) Both types of satisfaction will vary inversely with competitiveness of student-student relationships; and (3) Both types of satisfaction will vary inversely with student expectation-reality discrepancy. The results provided very strong support for the first two hypotheses and moderate support for the third hypothesis.

STRUCTURE AND FUNCTIONS

-- Fox, Karl A.

"Practical Optimization Models for University Departments"

Draft of a paper prepared for a volume on Analytical Models for University Planning, to be published by the North-Holland Publishing Company, Amsterdam, 1972.

The author begins with the premise that a typical department in a large public university operates on two principal environments: (1) the undergraduate programs, data systems and administrative constraints of its own university; and (2) the graduate training, research and publication system of its national scientific community. He goes on to characterize these two environments on both conceptual and illustrative-empirical levels. Models are presented which the author feels should be useful in discussions of alternative instructional patterns within a given university and of alternative federal policies and funding levels for graduate training and university research within and among national scientific communities. The discussion includes treatment of a department's environment within its own university, the relationship of a department to its national scientific community, an activity analysis model of a department, the unit cost and workload comparisons for two departments, undergraduate program quality and enrollment response, and other factors related to the operation of departments.

ADMISSIONS

-- Harvey, James

"Graduate School Admissions"

Research Currents, ERIC Clearinghouse on Higher Education, November 15, 1971.

Mr. Harvey begins by noting that admissions processes in graduate education are heavily criticized in the literature for poor recruitment procedures and the use of criteria unrelated to academic success. His review examines the factors related to student enrollment in graduate programs, the policies and procedures followed by graduate departments, and draws some implications for the improvements of the admissions process. He points out that virtually everyone writing on graduate school admissions agrees that many students have delayed to their disadvantage entry into graduate school and goes on to examine the factors behind those delayed decisions. He also discusses graduate admissions procedures, the validity of admissions criteria, the implications for recruitment, and the implications for admissions policies.

I N S T R U C T I O N A N D R E S E A R C H

-- Burke, William J.

"Graduate Education and Research - The Future"

Speech delivered at the Midwest Conference on Graduate Study and Research, Chicago, Illinois, March 20, 1972.

The author reviews what he considers to be some of the most important aspects of graduate education and suggests that much of the information we have today concerning graduate education is limited and out of date. He examines the degree to which graduate schools and universities generally will be permitted to manage their own affairs, and some encouraging signs for graduate education (e.g., the work of the Midwest Conference Committee on Graduate Standards and Graduate Programs, the work of the Western Association of Graduate Schools, the Gradcost Study, and the establishment of the National Board on Graduate Education).

He also looks at many other problems facing graduate education and calls attention to several useful reports. He concludes by suggesting that it can be expected that more attention and support will be given in the future to applied problems of immediate concern, but it is reasonable to expect that at least adequate support will be continued for basic research. In his view, in looking to the future we should not lose sight of the great contributions of graduate education despite its many shortcomings.

-- Grenander, M. E.

"Ph.D. Referencemanship"

AAUP Bulletin, Vol. 57 (Summer, 1971), 352-354.

Observing that there is a movement to abolish grades sweeping the country, Grenander suggests that there is increasing reliance on letters of reference. The author provides some satirical comments on the "art" of writing references for admission to graduate programs. Seven typical questions found on graduate program application blanks are examined and their implications for the party who must complete them is explored.

-- National Research Council. Office of Scientific Personnel

Annual Report on Awards

Washington, D.C.: National Research Council, May, 1972.

This annual report under the aegis of the Office of Scientific Personnel covers Graduate and Postdoctoral Fellowships; Post-doctoral Research Associateships; and Lecturing and Research Appointments Abroad. This report is a summary of the activities during the Fiscal Year 1972, including data concerning the numbers of applications submitted, awards offered, and panelists serving in the various programs.

-- National Science Foundation

Federal Funds for Research, Development, and Other Scientific Activities, Fiscal Years 1970, 1971, and 1972.

Washington, D.C.: U.S. Government Printing Office, (NSF 71-35), 1972.

This report is the most recent in an annual series that provides comprehensive statistical information on the size and scope of federal research and development activities. It is based on the President's budget for fiscal year 1972. In the Federal Funds series, obligations for research and development activity and research and development plans are given for each agency and agency subdivision. Data are also presented by agencies for character of work (basic research, applied research, and development), performer, and field of science. Historical tables, using the same breakdowns as the current data, are provided to show trends. This volume (No. 20) also contains an analysis of Federal R & D obligations by State for fiscal year 1970.

DEGREES

-- Marshall, Max S.

"Reappraising the Ph.D."

School & Society, Vol. 100 (March, 1972), 231-232.

The author takes the position that the Ph.D. degree has been oversold numerically and qualitatively. In his view, the Ph.D., because of the small number of holders, once meant a narrow sort of distinction in a chosen field and now it is claimed to be sort of master pass. Nevertheless, the degree tells us little about judgment or performance. It represents merely several years of experience with a few of many possible academic ingredients.

He suggests that it is time that the Ph.D. meant what it is supposed to mean -- "Not a key to the world, but one form of scholarly beginning to professorship." The value of the Ph.D., according to Marshall, depreciates rapidly with age. "At 35, 45, or 55, persons probably will have had from 13 to at least 33 years of experience at something notably overshadowing the presence or absence of the degree." Over-rating the Ph.D. causes us to ignore significant personal qualities which are not part of either the Ph.D. or maturity, and to read into it "glories that are not there."

Marshall stresses that the Ph.D. is only one way to get a start in life, not necessarily the best. Whether or not the holder is an able scholar or something else desired remains to be proved. Wanted qualifications are often evident without any thought of the degree.

He concludes by pointing out that to recognize the limitations of the degree does not demean it. To favor holders of a degree as a mark of prestige, however, is not a reasoned move -- in his view -- it is a confession of conceit.

-- School and Society

"New Professional Studies Degrees"

School and Society, Vol. 99 (October, 1971), 330-332.

This is a report that all institutions of higher education in New York State meeting certain requirements have been authorized by the Board of Regents to add Bachelor of Professional Studies and Doctor of Professional Studies to the list of general degrees which may be confirmed. The intent of this action taken by the Regents was to "arrest the proliferation of degrees in special professional fields."

The graduate professional degrees are comprised of advanced studies in professional or vocational fields. While they may have a strong inclusion of theory, they have as their primary purpose knowledge for application in professional practice.

-- Volpe, Edmond L.

"The Confessions of a Fallen Man: Ascent to the D.A."

College English, Vol. 33 (April, 1972), 765-779.

The author, former chairman of the English Department at City College (CUNY), discusses the set of professional values and skills he feels the college teacher of the future must be equipped with. He suggests that the college teacher of the future must be more student-oriented and far more flexible than our present Ph.D.'s, and also be capable of assuming and enjoy assuming a wider range of responsibilities. He argues that undergraduate education should not and cannot be graduate education at a lower level. He is convinced that the proposal of the Carnegie Commission on Higher Education that a new degree (the Doctor of Arts) be established as the basic degree for all college teachers, with the Ph.D. reserved for published scholarship of high caliber, offers a sensible solution to the pressing problems he discusses in the article.

-- Wiltsey, Robert G.

Doctoral Use of Foreign Languages: Part I

Princeton, New Jersey: Educational Testing Service, 1972.

A major issue in the controversy over the doctoral foreign language requirement is whether the languages are used, especially for professional purposes. In an effort to gather current information that would prove helpful to those in graduate education who must make decisions about the foreign language requirement, a 33-item questionnaire was developed with the assistance of the Graduate School Foreign Language Tests Committee of the Graduate Record Examinations Board. The overview of the literature includes a discussion of supporting arguments, opposing arguments, and suggested modifications of the requirement. The discussion centering around pertinent research results include treatment of the nature of the requirement, responsibility for the requirement, substitution of other skills, standards of proficiency, changes in requirements, and the use of foreign languages.

-- Wiltsey, Robert G.

Doctoral Use of Foreign Languages: A Survey, Part II

Princeton, New Jersey: Educational Testing Service, 1972.

In 1970 a memorandum was sent to the deans of graduate schools requesting assistance in providing current addresses for their doctoral recipients from July, 1959 through June 30, 1969. Samples were randomly drawn from the National Research Council's Doctorate Records File for a national survey which was being conducted for the Graduate Record

Examinations Board in order to discover whether doctoral recipients used their foreign language skills in graduate school or in the later professional activities. "Part I" is a detailed report of the study. This section, "Part II," contains complete tables of the results of the survey.

PROGRAMS

-- Stewart, D. H.

"Prospects for the Doctor of Arts Degree"

College English, Vol. 33 (April, 1972), 780-795.

The author begins by noting that the number of schools planning Doctor of Arts programs rose toward one hundred during the past year and that a reaction has set in. He notes that there is a need to examine the objections to the D.A. that will be advanced in order to decide whether the D.A. can survive and whether it should survive in the face of a certain amount of hostility and considerable indifference. He rehearses the opposing arguments, delivers some remarks about the role of the Ph.D., and concludes by explaining the D.A.'s importance.

-- Union of Experimenting Colleges and Universities

University Without Walls: A First Report

Yellow Springs, Ohio: Antioch College, May, 1972.

This is a report on alternative programs for undergraduate education now underway in twenty institutions across the country. According to the report, all University Without Walls institutions are implementing such key concepts as wide age range, broader range of resources, individualized programs, adjunct faculty, fostering self-disciplined study, and assessment of competence rather than counting of credit hours. The report includes discussion of the beginnings of the experiment, the participating institutions, the planning process, getting under way, selection of students, the UWW program and how it works, current developments, award of the degree, research on the program, and numerous other topics related to its program.

While this report and the University Without Walls are directed at concerns of undergraduate education, the success or failure of this educational experiment is sure to have important implications for graduate education. For example, in the area of graduate admissions alone, an untold number of entirely new questions may have to be asked by admissions officers in the course of reviewing the records of UWW graduates. It is because leaders in graduate education must be thoroughly versed in the new experiments being conducted in undergraduate education that the report is included in this bibliography on graduate education.

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M A N P O W E R

-- Foster, Penny D., and Huckenpahler, J. G.

Graduate Student Support and Manpower Resources in Graduate Science Education, Fall 1970.

Washington, D.C.: National Science Foundation (NSF 71-27), 1971.

This fall 1970 report on graduate enrollment in doctorate science departments is the fourth in a series of published reports presenting data submitted in traineeship grant applications by doctorate-granting institutions. It was prepared in the National Science Foundation's Division of Science Resources Studies. The report summarizes data submitted for fall 1970 by 3,071 doctorate science departments of 227 institutions applying for NSF traineeship grants for 1971. The trend statistics were based on information received from 2,236 doctorate departments submitting data for each of the years 1967 through 1970. The report provides some insight into the changing patterns of public and private support of graduate education in doctorate science departments since it presents basic data which will be useful in the assessment of levels. For example, the information pertaining to the policy shift from direct support of graduate students by Federal agencies to indirect support through funding of research grants and contracts can assist evaluation in terms of probable research support levels.

Treatment of the data includes a discussion of graduate enrollment in doctorate science departments; types of major support of full-time graduate students in doctorate departments; sources of major support of full-time graduate students in doctorate departments; and faculty and postdoctorals in doctorate departments.

-- Harvey, James

"Effects of the Ph.D. Glut"

Change, Vol. 4 (April, 1972), 13.

Mr. Harvey begins by noting that for decades recipients of the Ph.D. have been accustomed to a high demand for their skills, and that with a few exceptions, manpower experts during the sixties predicted the demand would continue in the foreseeable future. He goes on to argue that the major manpower problem is not mass unemployment among doctorate holders; it is the failure of available jobs to meet the expectations of graduates. Some Ph.D.'s have to accept virtually any position offered, in contrast to the sixties.

Upon closer scrutiny, there is some reason to believe that the current unemployment situation results from financial constraints rather than an excess of Ph.D.'s. Some have suggested that problems with Ph.D. employment stemmed not from overproduction of Ph.D.'s, but from the financial inability of colleges and universities to hire them. The tendency is to believe that the employment picture for Ph.D.'s will improve when these financial problems are removed.

Mr. Harvey maintains that it is, nonetheless, difficult to argue with the evidence that if current trends continue, too many Ph.D.'s will be produced for appropriate employment. There is general agreement that substantial unemployment will not result; instead, it is expected that education requirements for various positions will be upgraded, and that Ph.D.'s will displace people with master's degrees. He feels that changes within doctoral programs should center on both counseling the graduate student and the content of graduate education. Graduate students have virtually no guidance; guidance should be available and include information on the employment outlook. He goes on to touch upon the questions of research and federal funding.

-- Higgins, A. Stephen

"Quantity and Quality of Doctoral Overproduction"

Educational Record, Vol. 52 (Summer, 1971), 262-266.

The author analyzes the period surveys of graduate education such as the Cartter and Roose-Anderson reports of the American Council on Education. He asks whether or not such reports are useful and worth repeating. He examines specifically doctoral overproduction as well as the quantity and quality of programs in English, history, economics, and physics. The author offers some suggested adjustments and comments on the effect of small programs. He concludes that on the basis of the drastic changes that appeared between the 1964 and 1969 surveys the ratings are not in any way fixed and that unless such surveys are produced on a regular basis, much important information desperately needed in higher education will be lost.

-- National Research Council. Office of Scientific Personnel

Summary Report 1971 Doctorate Recipients from United States Universities

Washington, D.C.: National Research Council (OSP-MS-6), April, 1972.

This summary report is based on data obtained from the Survey of Earned Doctorates during fiscal year 1971. Questionnaire forms, distributed with the cooperation of graduate deans, are filled out by graduates as they complete all requirements for their doctoral degrees. The survey is conducted annually by the Office of Scientific Personnel of the National Research Council. This is the fifth in a series of yearly summaries. Information is collected on such items as postgraduation plans, financial support, professional work experience prior to the doctorate, and others.

-- Powel, John H., Jr., and Lamson, Robert D.

Elements Related to the Determination of Costs and Benefits of Graduate Education

Washington, D.C.: The Council of Graduate Schools in the United States, 1972.

This study and analysis of the literature relative to the costs and benefits of graduate education (the GRADCOST study) was begun as a result of a resolution passed in December 1968 at the Annual Meeting of the Council of Graduate Schools in the United States. It is based on the premise that there is a major need for accepted procedures and illustrative information concerning allocation of college and university costs on a basis of outputs or benefits arising from the activities of the institution. More specifically, it appears that information on the total costs and also the total benefits of graduate education will be found useful by colleges and universities, as an aid to establishing priorities among continuing and/or new graduate and related programs. Topics treated include the following: (1) Cost Allocation: the Historical Perspective; (2) The Benefits of Graduate Education; (3) Costing Higher Education Outputs: Conceptual Problems and Alternative Approaches; (4) Measurement of Direct Costs; (5) Procedures for Indirect Cost Allocation; (6) Bases for Indirect Cost Allocation; (7) Allocation of Research Costs; and (8) Partial Evidence on the Costs of Graduate Education. A bibliography is included.

-- Rorty, Richard

"Status and Future of the Profession"

American Philosophical Association Bulletin, No. 8 (November, 1971), 7.

The author reports on the work of the Committee on the Status and Future of the Profession for the American Philosophical Association. The Committee's work centered around four areas: the job crisis, the position of women in philosophy, the position of philosophy in two-year colleges, and the position of blacks in philosophy. The first area was the primary concern of the committee, whereas the others were dealt with largely by three subcommittees. The information described in the report is based upon data collected from philosophy departments in June of 1971 by way of a questionnaire. Among the several conclusions drawn, the author points out that the presently-planned rate of change in enrollments will not significantly affect the job situation for many years to come.

-- U. S. Department of Labor

Manpower Issues in the Professions and Higher Education

Washington, D.C.: U.S. Government Printing Office, 1972.

Each year the President sends to the Congress a comprehensive report on the Nation's manpower problems and programs, as required by the Manpower Development and Training Act of 1962. This is a reprint of one chapter of the President's report. Topics discussed include an overview of the manpower issues in the professions and higher education, the changed job market for professional personnel, prospective trends in demand and supply, elementary and secondary school teachers, scientists and engineers, and health manpower.

-- U. S. Government Printing Office

American Science Manpower, 1970

Washington, D.C.: U. S. Government Printing Office, 1972.

This reference document is the eighth and last in the biennial series which began in 1954. The report brings together detailed statistical information collected from 313,000 physical, mathematical, life and social scientists. Data are presented on education, employment, salary, field and subfield of science, State and metropolitan area distribution, support by Federal government funds, university and college scientists, women scientists, and foreign-language capability. The registration of scientists was carried out as a cooperative undertaking of the National Science Foundation and 13 major professional societies. Coverage is estimated at about one-half of all U.S. scientists.

-- Vaughan, Ted R. and Sjoberg, Gideon

"The Politics of Projection: A Critique of Cartter's Analysis"

Science, Vol. 177 (July 14, 1972), 142-147.

The authors examine Allan M. Cartter's thesis that American graduate education is oriented toward the systematic overproduction unless policies are altered drastically. Noting that Cartter's thesis has gained widespread acceptance, they argue that it can be faulted on a number of critical points. They review what they feel to be the essentials of Cartter's argument, the impact of Cartter's argument,

assumptions underlying his argument, and they present a reevaluation of Cartter's assumptions concerning American society. They conclude by noting that Cartter's thesis deserves far more critical attention than it has received, and suggest that his projections, if accepted uncritically, will have unfortunate political consequences for higher education and for the society at large.

EMPLOYMENT

-- Huther, John W.

"Small Market for Ph.D.'s: the Public Two-Year College"

AAUP Bulletin, Vol. 58 (Spring, 1972), 17-20.

Mr. Huther argues that the central issue in Ph.D. production is no longer whether or not there will be a surplus, but how large the surplus will be and how the surplus manpower will be employed. He examines the role of the public two-year colleges in employing the Ph.D.'s as one means of absorbing the surplus. He also discusses the projection of doctorates needed by public two-year colleges from 1971 to 1980, and he suggests that universities might consider modifying admissions to doctoral programs in such a way as to encourage experienced two-year college faculty to pursue the degree on a part-time basis over a period of years.

-- Vetter, Betty

"The Changing Demand for Scientists and Engineers"

Speech delivered to the Western Association of Graduate Schools, Tempe, Arizona, March 6, 1972.

The author is the Executive Director of the Scientific Manpower Commission and examines the current employment picture in science and engineering. She also comments on how we arrived at our present state of affairs and looks ahead at potential supply (in the form of enrollment data) and the potential demand in the form of forecasts. She indicates that after working laboriously through the available statistics that measure both supply and demand, she is left with a general feeling optimism by indications that there will be no substantial surplus of scientists and engineers in another year or two. She also feels that the shortages, particularly at the bachelor's level, that appear to dominate the second half of the decade will not be serious enough to jeopardize national progress. She recommends that graduate schools

continue their self-inspection with an eye not only to the number of graduates they are willing to produce, but to the flexibility of these graduates in their attitudes about the kinds of jobs they are preparing to fill (as well as in their ability to change direction) at least to some degree during their years in the educational pipeline as new directions are indicated by other developments.

ENROLLMENT

-- National Science Foundation

"First-Year, Full-Time Graduate Science Enrollment Continues to Decline"

Science Resources Studies Highlights, (NSF 72-308), May 25, 1972

The findings in this issue of Highlights are the result of a recent study of departmental data derived from traineeship applications. These data were supplied to the National Science Foundation by 2,990 doctorate-granting departments and are considered highly representative of the national science enrollment picture by the authors. They provide five major findings: (1) In doctorate-granting institutions, first year, full-time graduate science enrollment decreased 5 percent between 1970 and 1971, after decreasing 2 percent in the previous year; (2) The "top 20" graduate institutions experience reductions in their first-year, full-time enrollment at the greatest rate--8 percent; (3) Virtually all areas of science experienced reductions in first-year, full-time enrollment; (4) The number of full-time graduate students supported primarily by fellowships and traineeships declined nearly 10 percent from 1970 to 1971; and (5) The proportion of full-time graduate students receiving their primary support from the Federal Government declined from 37 percent in 1969 to 32 percent in 1971.

-- Page, J. Boyd

"Graduate School Enrollments"

School and Society, Vol. 100 (April, 1972), 217-218.

The article reports on the findings presented by J. Boyd Page, President of The Council of Graduate Schools in the United States, at the annual meeting in Washington. Among the findings reported were the following: (1) despite reports of an overabundance of advanced degree holders in the economy, the total student enrollment in the nation's graduate schools is holding steady; and (2) the number of degrees awarded continues to increase.

PLANNING

-- Weathersby, George B.

Structural Issues in the Supply and Demand for Scientific Manpower: Implications for National Manpower Policy

Berkeley: University of California, Office of the Vice President-Planning, 1972.

This report is one of a continuing series of reports of the Ford Foundation sponsored Research Program in University Administration. This particular report suggests that in addition to responding to surface manifestations of imbalance in scientific manpower supply and demand, we should examine and understand far better than we do the nature and extent of the structural forces operative on the supply and demand of scientific manpower. The current manpower policies may be inducing highly undesirable structural changes in the use of educated manpower which may have led to our current imbalances and the continuation of current policies may well exacerbate the underlying problem. The author's treatment of the data includes examination of the problems of scientific manpower supply and demand, the evaluative criteria for scientific manpower supply and demand, the federal manpower planning role within current structures of resource use, and the federal role in changing the patterns of use of scientific manpower.

C O S T S A N D F I N A N C I N G

-- Carnegie Commission on Higher Education

The More Effective Use of Resources

New York: McGraw-Hill Book Company, 1972

The report calls attention to the unprecedented financial crisis in higher education and the concomitant loss of confidence of higher education in its capacity to achieve continued progress toward equality of opportunity and toward the advancement of knowledge. The authors argue that if colleges and universities are to accomplish their purposes effectively, they must make wise decisions about the allocation of their resources and the use of their highly educated faculties.

Included in the discussion are sections on: (1) Dimensions of the Financial Crisis; (2) Utilization of Faculty Time; (3) Achieving Budgetary Flexibility; (4) Incentives for Constructive Change and Innovation; (5) The Planning and Control of Capital Costs, and (6) Other Avenues to Effective Use of Resources. In addition to those mentioned above, there are several other useful chapters.

Of particular interest to those concerned with graduate education are the suggestions made under "Major Themes." For example, the authors recommend halting the creation of any new Ph.D. programs except under very special circumstances, moving toward year-round operation, cautiously raising the student-faculty ratio, as well as other means of economizing.

-- McCarthy, Joseph L., and Deener, David R.

The Costs and Benefits of Graduate Education: A Commentary with Recommendations

Washington, D.C.: The Council of Graduate Schools in the United States, 1972.

This commentary consists in part of a summary of some of the information contained in another Gradcost report by John H. Powell, Jr. and Robert D. Lamson, which is entitled Elements Related to the Determination of the Costs and Benefits of Graduate Education, and it presents an excellent review and analysis of the subject literature.

The commentary sets forth the authors' personal views concerning the identity and preferred treatment of some of the difficult problems associated with consideration of the costs and benefits of graduate education. The intent is to outline in general terms a more or less consistent system which may be applied if needed in current situations as a base for consideration of the costs and benefits of graduate degree programs.

The authors believe that the commentary reflects in general the view of many in the graduate school community and hope that it may provide a stimulating framework for the further studies which they feel are urgently needed.

Topics treated include: (1) the Gradcost Study; (2) the Graduate Degree Program; (3) Outputs and Benefits; (4) Cost Definitions and Elements; (5) Graduate Student Financial Aid Costs; (6) Research Costs; (7) Direct Costs; (8) Indirect Costs; (9) Total Costs and Available Estimated Costs; and (10) Conclusions and Recommendations.

-- National Research Council. Office of Scientific Personnel

Summary Report of Activities: Fiscal Year 1971

Washington, D.C.: National Research Council, October, 1971.

The Office of Scientific Personnel is concerned with the education of scientists and engineers and with their utilization in the national development of science and engineering. It conducts association and fellowship programs, makes studies of manpower and educational problems, and provides a number of special services to Federal agencies and the academic community. The emphasis in these activities is on higher education in the sciences and engineering, especially graduate and postdoctoral education. This summary report prepared by the Advisory Committee to the Office of Scientific Personnel details the conduct of those activities described above for fiscal year 1971.

-- Powel, John H., Jr., and Lamson, Robert D.

An Annotated Bibliography of Literature Relating to the Costs and Benefits of Graduate Education

Washington, D.C.: The Council of Graduate Schools in the United States, 1972.

The authors attempt to cover most of the massive body of literature related to cost and benefits of graduate education. The bibliography is divided into four sections: (1) The Economics of Higher Education: Behavioral Models; Planning and Budgeting; The Financing of Higher Education; (2) Outputs and Benefits of Graduate Education; (3) Inputs and Costs-General: Conceptual Literature; Cost Structure Models; and (4) Inputs and Costs--Measurement: Direct Cost Studies; Full Cost Studies.

FEDERAL SUPPORT

-- National Science Foundation

Federal Funds for Academic Science, Fiscal Year 1970.

Washington, D.C.: National Science Foundation (NSF 72-301), 1972.

The report covers data collected through a system established by the Committee on Academic Science and Engineering (CASE) of the Federal Council for Science and Technology. The data provide information on Federal support to universities and colleges for research and development, science facilities and equipment, and science education. It includes an examination of science education in terms of four broad areas of support: manpower development; general support for science; educational institutes, seminars or conferences; and development of educational techniques and materials. In addition to analyses of type of activity, the report includes data pertaining to fields of science, agency sources of support, and geographic and institutional distribution of Federal funds.

R E C O M M E N D A T I O N S

-- Ben-David, Joseph

American Higher Education

New York: McGraw-Hill Book Company, 1972

The author examines the major trends in the development of American higher education during the 100 years in which its current patterns were most firmly set, and he reviews event and influences that have produced the tensions and conflicts that are so familiar today. In chapter six, "The Graduate School and Research," the author treats the professional school, the organization of research in the universities, quasidisciplinary research, statistics as a case in point, the growth of research as a profession, and university, industrial, and governmental research.

-- Clark, Lillian W.

"Graduate Education Today"

Chronicle, (The Graduate School, University of Maryland), March, 1972, 17-19.

The editor of the Chronicle, Lillian W. Clark, interviewed Michael J. Pelczar, Jr., Vice President for Graduate Studies and Research on a wide range of subjects relating to graduate education. In the course of their discussions, they touched upon a wide range of issues, such as the suggestion that there is a great deal of sameness in the emphasis on graduate programs throughout the nation, the problems associated with the establishment of new graduate programs in the present climate, the Doctor of Arts degree, and the role of liberal studies in graduate education. They also discussed current public skepticism about the value of graduate education, the role of the Master's degree, the relationship between graduate and undergraduate studies, the problems of finance, and other major concerns of graduate education.

-- Hadley, Paul E.

"The Role of the Graduate School in Continuing Education"

Paper delivered at the Midwest Conference on Graduate Study and Research, Chicago, March 20, 1972. (Mimeographed.)

The author takes the position that the pressures of the times are producing deep change in higher education at both the graduate and the undergraduate levels, and that much of this change is not only inevitable, but also necessary and desirable. As a dean of continuing education, he argues that the service of education at the highest level is required and that continuing education is the agency to promote and administer new service programs both credit and non-credit. He also calls on graduate schools to provide responsible direction, not to stifle change.

-- Harris, Seymour E.

A Statistical Portrait of Higher Education

New York: McGraw-Hill Book Company, 1972.

This work was prepared for the Carnegie Commission of Higher Education as an answer to its need for a systematic presentation of the financial and historical data relevant to its various current studies.

The author, an expert in the economics of higher education, helps to clarify the meaning and significance of the statistics of higher education. From the thousands of tabulations that have been made by government agencies, private surveys, and extensive research projects, he has selected 700 key tables, has commented upon their significance to the history and economy of higher education, and has provided guidance to their sources. The 28 chapters of this work cover questions relating to students, enrollments, faculties, income, and expenditures.

While this work is a valuable general reference for both serious students of higher education and administrators engaged in policy making, however, it contains several excellent sections and tables related specifically to graduate education. Included is a discussion of graduate student characteristics, graduate students aid, graduate student expenses, graduate enrollment, degrees and enrollments, the concentration of higher degrees, and the growth of Ph.D.'s. The work also includes tables on graduate student characteristics, aid, enrollment, fellowship support, graduate student enrollment, and other related topics.

-- Smith, Richard, and Fiedler, Fred

"The Measurement of Scholarly Work: A Critical Review of the Literature"

Educational Record, Vol. 52 (Summer, 1971), 225-232

The authors examine past and present efforts at evaluation of scholarly work through an examination of individual and departmental

ratings by scholars, publication quantity and quality, awards, and citations to published works. They feel that colleges and universities are going to be faced with closer scrutiny of the effectiveness with which they meet both their own objectives and society's goals. Hence, the question of evaluation has become paramount at this juncture. Their analysis begins with a brief historical overview of evaluation efforts, and go on to examine several of the criteria used in evaluation. The criteria include individual performance measures, research publication quantity, citation measures, supporting research, journal quality index, and research relationships.

PLANNING

-- Wolfle, Dael

The Home of Science: the Role of the University

New York: McGraw-Hill Book Company, 1972.

In the discussion of trends, policies, and problems in the area of financial support alone, this book makes a large contribution to those responsible for planning, and funding higher education's future. Among those questions examined by the author are the following: How did scientific endeavor develop in America? What circumstances led to the development of the American university? What have been science's impacts on the traditional American college, upon fields of learning, and upon patterns of financial support for higher education? The book includes chapters on the professionalization of science, the search for sponsors, choosing the university, the effects on science, influences on higher education, 1945 and on, a universities' research rationale, and future policy.

-- Schein, Edgar H.

Professional Education: Some New Directions

New York. McGraw-Hill Book Company, 1972

The author argues that impending changes in professional education not be allowed simply to happen but that they be carefully planned. His underlying assumption is that professional education in the United States will change significantly in the decades immediately ahead. He analyzes new features of professional practice and shifting expectations of professional students, and undertakes an analysis of the anatomy of change itself.

Treatment includes discussion of the following topics:
1) What is a Profession?; 2) The Changing Work Setting of Professionals; 3) New Clients, New Client Needs; 4) The Changing Needs of Society; 5) The Profession's Perspective on Itself; 6) The Changing Values and Needs of Students; 7) New Directions for Professional Education; 8) A Model of the Process of Planned Change; 9) Change Goals, Points of Entry, and First Steps; 10) Innovative Mechanisms for Professional Education; and 11) Some Bold Horizons: A New Kind of Professional Education.

PURPOSES AND GOALS

-- Dillon, John A., Jr., McGrath, James W., and Ray, Dale C.

"Research and the Universities"

Journal of Higher Education, Vol. 43 (April, 1972) 257-266.

Beginning with the assumption that society periodically reacts violently against practices and policies which were formerly basic to its functioning and that such is presently the case with the notion of research, the authors argue that fundamental revisions within the system vis-a-vis research are needed. Before making such revisions, it is necessary to consider where we are and where we wish to go. In this vein, the authors analyze the role of higher education with a view to ascertaining how it got where it is and what circumstances must surround its continuance.

Topics examined include: 1) Research, Its Origins and Methods; 2) The Role of Universities in Research; 3) The Moral Issue (control and use of research); 4) Research Support and Its Implications; and 5) Thoughts for the Future. They conclude that the following steps should be taken in the future:

1. Universities must maintain and support research in a balanced program with their teaching service.

2. Federal support for research should be developed on a stable, long-term basis rather than on the basis of a crisis philosophy. Research capability cannot be turned on and off like water from a tap. By building up a balanced program in all fields, the necessary knowledge to attack a variety of problems can be assured in the future.

3. The main research activity of a university should be concentrated in the basic and certain applied areas rather than in development. The research should be unclassified so that the free exchange and student involvement, which are a university's greatest strength, will not be compromised.

-- Kent, Leonard J.. and Springer, George P.

Graduate Education Today and Tomorrow

Albuquerque: University of New Mexico Press, 1972.

The essays in this collection offer answers to some of the questions central to graduate education. For example, what is the purpose of graduate education: is it to create Ph.D.'s or to increase the glory of the human spirit? Is it for the students, the faculty, or society? How have the goals and methods of the graduate school evolved in recent years?

The authors of the several chapters are graduate school administrators from across the country. In addition to those kinds of fundamental questions cited above, they take up question about particular aspects of graduate education today, such as the problems confronted by specific fields of study, and they deal as well with future developments, such as interdisciplinary programs, the Doctor of Arts degree, and the need for greater attention to teaching.

-- Mayhew, Lewis B.

Graduate and Professional Education, 1980.

New York: McGraw-Hill Book Company, 1970.

This research study was sponsored by the Carnegie Commission on Higher Education and describes the results of a survey of institutional plans regarding graduate and professional plans during the current decade. Mayhew examines the "developed" and "developing" institutions of higher education and concludes that the seventies will bring no cease in the headlong expansion of the graduate and professional programs. His survey of the plans of several hundred institutions provide data on expansion is useful.

-- Mayhew, Lewis B.

Reform in Graduate Education

Atlanta, Georgia: Southern Regional Education Board, 1972.

This is the fifth in a series of SREB monographs dealing with curricular matter in higher education. This particular monograph is concerned with changes, innovations, and reforms in graduate education in the arts and sciences. The author notes that while continuing criticisms of graduate education in the arts and sciences are to be heard, actual change, innovation, or efforts to reform

were not merely so evident in graduate schools or divisions or arts and sciences as was true in the professional schools. The monograph includes treatment of the setting, and analysis of curriculum and instruction. structure and organization, the preparation of college teachers. some old and new issues and some guidelines for change.

-- Weisskopf, Victor F.

"The Significance of Science"

Science, Vol. 176 (April 14, 1972), 138-146.

The author discusses cultural and social aspects of science and its relation to society. He argues that our system of higher education cannot be held responsible for the ills of mankind. Noting that science is under severe attack from some quarters, he points out that it is considered a panacea for the cure of all ills by others. He goes on to sketch three positions in regard to science that characterize some of the common attitudes toward this problem. First, many branches of science have grown excessively during the recent decades: too large amounts of public support and too much scientific manpower are devoted to esoteric research in fields that have little to do with practical problems. Second, most of today's scientific research is detrimental to society because it is the source of industrial innovations, most of which have led and will lead to further deterioration of our environment, to an inhuman computerized ways of life destroying the social fabric of our society, to more dangerous and destructive applications in weaponry leading to wars of annihilation, and to further development of our society toward Orwell's world of 1984. Third, the methods and approaches used in the natural sciences and in technology -- the so-called scientific method -- has proved overwhelmingly successful in resolving problems in elucidating situations, in explaining phenomena of the natural world, and in attaining well-defined aims.

-- Whaley, W. Gordon (ed.)

In These Times: A Look at Graduate Education with Proposals for the Future

Austin, Texas: The Graduate Journal, Publisher, 1972.

The authors begin with the premise that graduate education is the least understood part of higher education. They attempt to examine graduate education as a process and in the course of their discussions illuminate some of the reasons for the difficulties in communicating understanding about graduate education. The essays are concerned with its successes and failures, with attention to its organizational structure, the functional inadequacies, and what the authors view as the "inhumanity" of the

educational system. Examples from among the twenty-three essays include the following: The American Graduate School, Stephen H. Spurr; In Search of Higher Education, Alan F. Shaw; The Idea of Disinterestedness in the University, Gordon N. Ray; The Scientific University and the Socio-Technological Institute in the 21st Century, Alvin M. Weinberg; A New Social Role, Samuel B. Gould; A New Mission, Charles F. Jones; Open and Closed Systems, Louis T. Benezet; Graduate Education Vis-a-Vis the Work It Helped to Create, Richard L. Predmore; The Ph.D. in the Humanities, Barnaby C. Keeney; The Graduate Study of Modern Literature, Don Cameron Allen; The Graduate School Experience: A Black Student Viewpoint, John H. Bracey, Jr.; and The Meaning of Black Studies, Nathan Hare.

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AN ANNOTATED INTEROFFICE BIBLIOGRAPHY
ON GRADUATE EDUCATION

Part III

National Board on Graduate Education
Office of the Chairman
345 Armory, University of Illinois
Champaign, Illinois 61820

December 31, 1972

P R E F A C E

This publication is the third in a series of Interoffice Annotated Bibliographies developed for use in the Office of the Chairman and that of the Staff Director of the National Board on Graduate Education. The purpose of the bibliographies is to compile concisely annotated references of those materials (books, articles, reviews, and others), published and unpublished, which make a contribution to the expanding literature on graduate education and which continually arrive at the offices of National Board on Graduate Education. With each annotation, we have attempted to treat the author's intent and method, the major areas discussed, and the pertinent conclusions reached.

The content of part III includes only those documents sent to us or brought to our attention between August 15, 1972 and December 31, 1972. Part I in the series included materials received between February 1, 1972 and April 30, 1972. Part II included materials received between April 30, 1972 and August 15, 1972.

The organization and categories used here follow those employed in the two bibliographies prepared by Wayne C. Hall: 1) Annotated Bibliography on Graduate Education: 1950-1971; and 2) An Annotated Bibliography on Graduate Education, 1971-1972. The former was prepared under the aegis of the Office of Scientific Personnel of the National Research Council and published by the National Board on Graduate Education. The 1971-72 bibliography was commissioned by the National Board on Graduate Education.

While this Interoffice Bibliography on Graduate Education serves primarily as a working document for the offices and members of the National Board, it may serve others concerned with the study of present issues and the future of graduate education.

Edward L. Allen
Staff Associate
Champaign, Illinois
December, 1972

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HISTORY AND DEVELOPMENT

COLLEGES AND UNIVERSITIES

-- Toombs, William

"Reluctant Courtship: Community College and Graduate School"

Educational Record, Vol. 53 (Summer, 1972), 222-226.

The author begins by noting that among the most significant developments in the decade of the sixties, characterized by the unusual speed and scope of growth within the educational field, no development was more remarkable than the incorporation of the two-year college into the life of all 50 states. In his view, this major development was all the more striking because it took place in an atmosphere of indifference on the part of graduate schools in the major universities.

He examines two persisting questions related to the development of the junior college movement and the lack of attention given that movement by the graduate schools: 1) Why has there been so little liaison between graduate schools and two-year colleges, two segments of the educational enterprise both so successful in their own way? and 2) What is the prospect for change? He suggests that the problem between the community colleges and the universities is relational rather than one of content of knowledge. The lack of liaison stems, at least in part, from the fact that graduate schools and community colleges have simply been oriented in different directions.

Toombs also describes a seminar on community college personnel conducted at Pennsylvania State University between presidents or representatives of two-year institutions and deans from a number of colleges in the university. At that conference several recurring themes highlighted the principal issues and some of the directions for their resolution as the community colleges and graduate schools work toward a meaningful relationship.

STRUCTURE AND FUNCTION

ADMISSIONS

-- Shoemer, James R., Thomas, James R., and Bragonier, Wendell H.

A Study of the Effect of Non-traditional Grades on Admission to Graduate School and the Awarding of Financial Aid

Fort Collins, Colorado: Colorado State University, 1972. (Mimeographed)

In addition to seeking information about the effect of non-traditional grades on admission to graduate school and chances for financial assistance such as fellowships, assistantships, and grants, this study sought information concerning the manner in which non-traditional grades are used by graduate schools and the various attitudes of graduate deans concerning non-traditional grading.

In general, the data indicated that moderate percentages on non-traditional grades (less than 10 percent) have little hinderance on a student's chances for admission to graduate school. Although the effect is somewhat more pronounced, moderate numbers of non-traditional grades also do not have a serious effect on one's chances for admission and financial support. However, when a student's records indicate 10 percent or more non-traditional grades, his chances for admission and financial support become jeopardized. No significant differences were found between public and private institutions, nor were significant differences found between graduate schools of difference sizes.

Further, the authors found that graduate schools vary considerably in the manner in which they use non-traditional grades in arriving at admissions decisions. Some examples are provided. They also found that most graduate deans have negative feelings about non-traditional grading. They conclude that while deans of graduate schools are uneasy about non-traditional grades, they do accept moderate numbers of non-traditional grades without penalizing applicants.

I N S T R U C T I O N A N D R E S E A R C H

PROGRAMS

-- Cottrell, T. L.

"Problems Facing Research in the Natural Sciences"

CRE-Information, No. 19 (July, 1972), 3-11.

The author (Vice Chancellor, University of Stirling, England) discusses the prospects for the future of higher education for the Standing Conference of Rectors and Vice Chancellors of the European Universities. Beginning with the premise that current social demands for growth in higher education is a reflection of an optimistic view held by potential students and their parents that a university degree is a passport to a materially successful career, he examines the thesis that whatever the real social needs are that lie behind the demands for more higher education, they are not for more Ph.D.s with specialist experience in some branch of fundamental research in the natural sciences. Given the fact that future prospects seem clear and depressing because of the likely increase in students, less money for research, and fewer research students, Cottrell asks whether the prospect is really as clear and depressing as this and if so, what can be done to make it less depressing.

-- Dressel, Paul L.

"Graduate Programs: Experiments with Off-campus Learning"

Journal of Higher Education, Vol. XLIII (October, 1972), 525-530.

The author argues that the time is ripe for a return to emphasis on accomplishment rather than on time serving for graduate degrees. In his view, the major obstacle to taking such a step is the fact that we have moved to mass production which emphasizes credit accumulation without a clear conception of what insights, abilities, or accomplishments are the earmark of a graduate degree. Consequently, any attempt to recognize off-campus learning by granting degrees will be beset with problems in definition of standards of accomplishment. The establishment of off-campus graduate programs necessitates defining in detail the requirements and standards for a sound degree. Dressel identifies three distinctive indices for determining whether a program is truly at the doctoral level. First, if the original definition of expected accomplishments is not acceptable to competent judges of graduate education, then the program is inappropriate. Secondly, if the experiences planned are not sufficiently related to the goals and do not require and insure some continuing development of scholarship, the program is ineffective.

Thirdly, if there is not an adequate evaluation program conducted during and at the conclusion of the program to ascertain that the individual has indeed attained the standards and fulfilled the obligations initially described, then the program is inadequate.

-- Eble, Kenneth E.

"The Road to College Teaching Must Be Rebuilt or Repaired"

Chronicle of Higher Education, (Nov. 6, 1972), 6.

Mr. Eble reports on his experiences at a recent conference on "New Perspectives in Graduate Education," sponsored by the Wright Institute in Berkeley and led by Nevitt Sanford. He focuses his discussion on the preparation of teachers in graduate schools. He argues that efforts aimed at improving preparation of future college teachers in the graduate schools are increasing and will probably pay high dividends.

While he does not wish to imply that course work is the answer to better preparing college teachers, Eble feels that such courses at least indicate a genuine interest in the teaching aspect of a graduate student's career. He refers to several programs around the country which he feels have been fairly successful and ends by suggesting that a more positive approach to teaching is one of the important changes that may be coming into graduate education.

-- Elton, Charles F. and Rose, Harriett A.

"What Are the Ratings Rating?"

American Psychologist, Vol. 27 (March, 1972), 197-201.

The authors argue in this article that the institutional ratings of psychology departments appearing in the Cartter study on departmental ratings in various fields of study at the graduate level can be predicted by the use of simple data in the public domain which incorporate variables related to size. Two of the most salient implications they draw from their study are that: 1) the confusion between measures of quantity and quality is highlighted. They point out that while quantity and quality need not be mutually exclusive, it may be unwise for psychologists to conclude that where quantity exists, there also resides quality; and 2) there is a necessity to develop criteria against which to measure departmental quality. They suggest that departments presumably have neglected to address themselves to this problem because of the easy availability of size data, and that among the probable reasons for the absence of measures of departmental quality is the failure of departments to clarify their own goals.

They note that two contrary themes appear in the literature: one favors the quantitative emphasis expressed by the rating games, and the other seeks to define appropriate instructional objectives for the discipline of psychology.

-- National Science Foundation

Research and Development in Industry, 1970

Washington, D.C.: National Science Foundation (NSF 72-309).

This report is based on the National Science Foundation's survey of industrial research and development in 1970. It contains statistics on industrial research and development performance by source of financing, character of work, and geographic distribution. The report also includes basic research data presented by field of science. Applied research and development are shown by product field. Finally, the report includes data on full-time-equivalent numbers of research scientists and engineers as of January 1971.

M A N P O W E R

-- .Ahamad, Bashir, and Blaug, Mark, and Associates

The Practice of Manpower Forecasting

San Francisco: Jossey-Bass Inc., Publishers, 1972.

This work is a collection of case studies which provide a detailed analysis of forecasting work in a number of countries which have had a fairly long record in the field. They include the United States, Canada, Britain, France, and Sweden in the developed world, and India, Thailand, and Nigeria in the underdeveloped world. The analyses cover a wide variety of forecasting methods. The book examines forecasts for the labor force as a whole in addition to those for single field, such as science, engineering, teaching, and medicine. Analyses of short-term and long-term forecasts are provided, and the methodology of each is explained.

The authors argue that manpower forecasts can play a vital part in educational planning and in determining where and how investment in education should be made. Recognizing that forecasting attempts so far have been either inconclusive or outright failures, they attempt to show in illustrative cases what went wrong and why. The book also provides an international overview which suggests distinct patterns and similarities in forecasting.

EMPLOYMENT

-- Higgins, Stephen A.

"The Supply and Demand for Education Doctorates"

Phi Delta Kappan, Vol. 53 (May, 1972), 588-91.

Much of the recent discussion regarding the overproduction of doctorates has centered on the sciences as well as several related academic disciplines, and suggests that supply will continue to exceed demand during the next few years. Higgins turns the discussion to the field of education and calls attention to the fact that Allan Cartter warned in 1965 about an overproduction of doctorates by the early 1970s, that faculty quality in higher education, as measured by percentage of faculty holding the doctorate, was increasing, and that the "flight from teaching" was an academic myth, and that we would soon be hard-pressed to absorb even one-half of the doctorates who had historically entered the faculty ranks in our colleges and universities. Cartter used the field of education as one future area of overproduction to illustrate his case and Higgins expands on Cartter's observations.

Higgins bases his observations on two surveys conducted by the U.S. Office of Education. The first was conducted in October, 1963, and gathered information on full- and part-time faculty by academic area and by highest degree held. The second was conducted by the USOE in the fall of 1967 and provided another reference point for projecting supply and demand ratios. The article includes much useful statistical information.

ENROLLMENT

-- Adams, Walter

"The Undergraduate Experience"

Change, Vol. 4 (November, 1972), 14.

Mr. Adams reports on research resulting from a continuing study based on U.S. Census Bureau data which indicates that one of the major problems facing higher education in the next decade will be that posed by the question of undergraduate open enrollment. While his report focuses on undergraduate concerns, in particular enrollment trends, it makes a useful contribution to the literature on graduate education; and the question of enrollments, in that the data collected in the study indicate among other things that we can look forward to a major rise in the numbers and proportions of undergraduates aspiring to graduate education accompanied by mounting concern with access to graduate and professional schools and with the "payoff" of graduate education. According to the author, not only may absolute numbers of students in graduate and

professional school increase sharply, but also the ratio of persons earning baccalaureates only. The rise in the college attendance rates of high school graduates is about to be replicated at a higher educational level. In his view this development could prove to be a major problem in the latter 1970's and 1980's because it would be largely unanticipated. In short, graduate study can be expected to become the majority experience for college graduates, just as college entrance became the majority experience for high school graduates several decades earlier.

-- Blandford, Barbara A., and Dutton, Diane

Survey of First-year Graduate and Postdoctoral Enrollment in Science and Engineering

Washington, D.C.: American Council on Education Higher Education Panel Report, No. 1, August 19, 1971.

This report is based on a survey conducted in July of 1971 in which institutions were asked: 1) to indicate new applications received through July 5, 1970 and actual first-year graduate and postdoctoral enrollment for that year; and 2) to estimate enrollments for 1971 indicating the number of new applications received as of July 5, 1971. The survey focused on first-year graduate enrollment and postdoctoral enrollment in subfields of science and engineering.

Among the conclusions reached by the authors are the following:

1) Those fields that have increased their program size or scope are most often the physical sciences and engineering. The reason most often given for these increases is a larger demand in the job market; 2) Reduction of program size or scope, increased tuition, lowering of financial aid, restrictive admissions, suspended applications to Ph.D. programs occur most often graduate school-wide and not within any specific field, and generally reflect an institutional reaction to the current supply and demand situation in the job market; 3) The medical sciences are an exception to this general rule. In the medical sciences fewer students are being enrolled because of the termination of NIH-supported Training Grants which provided stipend support; 4) Two changes that occur together most often are the increase in tuition costs and the more restrictive admissions policies (including, in some cases, quotas on graduate enrollment); and 5) Changes in institutional policies made during 1970 that would affect postdoctoral enrollment were few.

-- Blandford, Barbara A., and Trexler, Joan C.

Expected First-year Graduate Enrollment in Science and Engineering, Fall 1972

Washington, D.C.: American Council on Education Higher Education Panel Report, No. 10, August 11, 1972.

This report is based on a survey conducted in July of 1972 in which institutions were asked: 1) to indicate how many new applications they had received through July 5, 1971, and what the actual first-year graduate enrollment for that year had been; and 2) to estimate enrollments for 1972, indicating the number of new applications received as of July 5, 1972. The survey was limited to institutions granting doctorates in science or engineering fields.

The authors found that an overall increase of two percent in first-year science and engineering graduate enrollments was anticipated in the fall of 1972, but the projected trends differed according to type of institution and field. Public institutions reported an expected increase, whereas private institutions said they expected a substantial decrease. They also report that the "top twenty" institutions expected declines in enrollments in all major science and engineering fields while "developing" institutions reported that they expected enrollments to drop in physical sciences, social sciences, and engineering, and to rise in the other major categories. What the authors describe as the remainder or "other" institutions make up the bulk of the Ph.D. granting institutions and they reported that increases in all major categories except engineering were expected.

-- Committee on Institutional Cooperation

Inventory of CIC Graduate School Doctoral Programs, 1961-1970

Evanston, Illinois: Committee on Institutional Cooperation, 1971.

This inventory of programs leading to the Doctorate in Philosophy in the eleven universities comprising the Committee on Institutional Cooperation is a project sponsored by the graduate deans of these universities. All graduate schools were asked in the survey to prepare a list of Ph.D. programs offered at their institution. All doctoral programs granted through the Graduate School are included (Ph.D., Ed.D., D.M.A., etc.). Professional doctorates (M.D., D.D.S., D.V.M., D.P.H., etc.) are not included. The classification basically follows that of the U.S. Office of Education, but was revised in some instances in order to approximate as closely as possible existing institutional practice. The report provides data on: 1) the number of graduate faculty involved in each area; 2) the number of doctoral students enrolled; and 3) the total number of doctorates granted in the time span covered in the survey.

-- Moses, Lincoln E.

"The Response of Graduate Enrollment to Placement Opportunities"

Science, Vol. 177 (August 11, 1972), 494-497.

The author begins by noting that the American Institute of Physics has for years kept detailed records of graduate and undergraduate enrollments, degrees granted, and many other kinds of information. Because physics provides the longest period of adjustment and the most comprehensive data of any field, he uses it as a point of departure in a thorough discussion of enrollment trends and projections. Based upon the data presented, he argues that marked reduction in numbers of entrants to graduate study powerfully readjusts the size of the Ph.D. crop, and that perceiving the adverse economic prospects, many "fewer qualified students go into physics." He interprets the decline in numbers of undergraduate physics majors and the decline in the percentage of those going on to become graduate students as deriving from the perception of adverse placement opportunities.

Examining the thesis that there will be reductions in graduate enrollments for the Ph.D. in general as a result of the postulated oversupply of Ph.D.'s, he discusses several important questions raised by that thesis. Which students will elect not to enter Ph.D. programs--- the more capable or the less capable? To what extent will newly recognized societal problems call for new Ph.D. programs? Which schools will feel the reductions in numbers? What would be desirable responses to the impending cessation of growth and the probable absolute downturn in the size of Ph.D. programs on the national scale?

He concludes by observing that two things are striking about the projections of physics Ph.D.'s for 1975 and 1980: 1) the wealth of comprehensive data available, because of the efforts of the American Institute of Physics, and 2) the way in which those data lead to answers quite different from those obtained by examining data of a more aggregated and less adequate nature (which he feels is the case in every discipline except physics). He argues that similar data collecting efforts must be conducted for other fields and suggests that such a task could be undertaken by the Office of Education or the Council of Graduate Schools.

-- National Science Foundation

"Changes in Graduate Programs in Science and Engineering, 1970-72 and 1972-74"

Washington, D.C.: National Science Foundation, Science Resources Studies Highlights, July 21, 1972 (NSF 72-311).

This report argues that the general expectation of a continuing large expansion in the number of graduate programs expressed a few years ago, particularly in the sciences, now appears unfounded. Available information now indicates that little expansion in graduate programs in science and engineering occurred in the past two years, and even less is expected in

the next two. These conclusions are made on the basis of data collected in a survey conducted for the Federal Government by the American Council on Education through its Higher Education Panel designed to determine the dynamics of growth and decline of graduate programs in higher education. The report examines quantitative changes in graduate programs both at the doctoral and masters levels.

C O S T S A N D F I N A N C I N G

FEDERAL SUPPORT POLICIES

-- McGinnis, Robert

Federal Funding and Graduate Education in Bioscience

Washington, D.C., The National Research Council, 1972. (Mimeographed)

This study was supported by the National Institute of General Medical Science and conducted by the Office of Scientific Personnel of the National Research Council. The purpose of the study was to study as quantitatively and analytically as possible the relationship between the number of doctorates awarded in biomedical fields by U.S. universities and the level of Federal support. The period considered was from 1947 to 1969. The author does not attempt to base specific policy recommendations on the results of the study nor to apply them to specific educational programs.

Specifically, the study represents an enquiry into what determines the size of our stock of scientists, or at least its "home-grown" segment. The research was also designed to attempt to determine the extent to which our "doctoral hatcheries, the nation's universities," are sensitive to and dependent on Federal funds for their production of scientists. Equally important, in the eyes of the author, was the question of whether our graduate schools are homogeneous in the doctoral scientists that they produce, or whether systematic differences can be found among these products in their subsequent careers. Twenty-one major findings resulting from the study are presented.

STUDENTS AND STIPENDS

-- Delehanty, George

"The Burden of Graduate Student Debt"

Paper prepared for The Committee on Institutional Cooperation, 1972.
(Mimeographed).

This paper is a report on the results of a survey of graduate student indebtedness at four midwestern universities (Northwestern, Minnesota, Iowa, and Ohio State). Research was undertaken in 1970-71 with the assistance of the CIC (the Big Ten Universities plus the University of Chicago).

The following represents a sample of the conclusions reached:

- 1) Among the universities sampled, about one-half of the graduate students report educational debt; 2) The median amount owed is \$1,800, with males owing somewhat more than females; 3) For a number of reasons, median debt amounts do not vary greatly with age, years of study, or field; and 4) A similarity of debt amounts exists among the public and private institutions in the sample.

SUPPORT AND FUNDING

-- Blandford, Barbara A., and Dutton, Diane

Research Support for Science Faculty

Washington, D.C.: American Council on Education Higher Education Panel Report, No. 2, November 4, 1971.

This report describes the results of the second survey of the Higher Education Panel, conducted during September and October of 1971. The survey concerned to the split of research funds between young and senior faculty at institutions granting Ph.D.s in science and engineering. While the report provides numerous tables and ample figures compiled as a result of the survey, there is little in the way of discussion of the meaning of data collected. No specific findings or conclusions are presented for the reader.

RECOMMENDATIONS

PURPOSES AND GOALS

-- Committee on Professional Training---the American Chemical Society

"Doctoral Education in Chemistry: Facing the 1970's"

Chemical and Engineering News, Vol. 50 (August 14, 1972), 35-39.

This Report of the Committee on Professional Training of the American Chemical Society focuses on the changing circumstances in graduate education and their implications for chemistry. The Report examines directly the problems of capacity (supply and demand), student admissions and quality, the nature and purpose of the Ph.D. in Chemistry, the hallmarks of a good program, and quality standards and production controls.

The committee reaches the decision that a number of informal approaches can be of value in maintaining and upgrading standards for Ph.D. education in chemistry, but that there are limitations to what can be accomplished on a more formal basis. In the committee's view, the rapid growth of graduate programs in the 1960's made ample facilities available and attracted many very able young people into graduate teaching. It is argued that what graduate schools can accomplish is now determined primarily by the quality of students which they can attract, and that staffs and faculties (while recognizing the realities of supply and demand during the 1970's) must remember that quality rather than quantity of research is what is important.

-- Hungate, Thad L.

Management in Higher Education

New York: Columbia University, Teachers College Press, 1964

While Hungate does not focus his attention directly on graduate education per se, in Appendix 5-A he presents a thorough overview of the problems and concerns relating to graduate education in the middle sixties. And although the book is eight years old, the discussion under "Research and Graduate Education" warrants continued attention by students of graduate education even today. His treatment includes discussion of: 1) research and scholarship; 2) the impact of research on finance; 3) the relation of teaching and research; 4) the implication of external controls on research; and 5) problems of the graduate school. The discussion is actually a presentation of the views of those considered to be the most competent scholars of graduate education during the sixties.

-- Seitz, Frederick

"Reflections on the Relationships Between Science and Technology and Society"

Science Policy Review, Vol. 5 (Two/1972), 3-10.

This article results of observations made by Dr. Seitz, President of Rockefeller University, in a speech given at Battelle's Science Policy Colloquium in May of 1972. It includes some thoughtful comments on the public's historically ambivalent attitude toward pure science and its current misgivings about the benefits of technology, the revolutionary boiling up and simmering down of the intellectual community, and the relaxation in moral standards.

He examines, among other topics, the present status of science, the present status of technology, the current social ferment, the uncertainty in professional societies, the break of traditional moral codes, the adjustment of industry, public expectations, and pure science. A central part of his discussion focuses on what he refers to as four areas of primary importance for the advancement of science and technology in our society; namely, the academic institutions, industrial research laboratories, free-standing research institutes both commercial and nonprofit, and the Federal research establishments.

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